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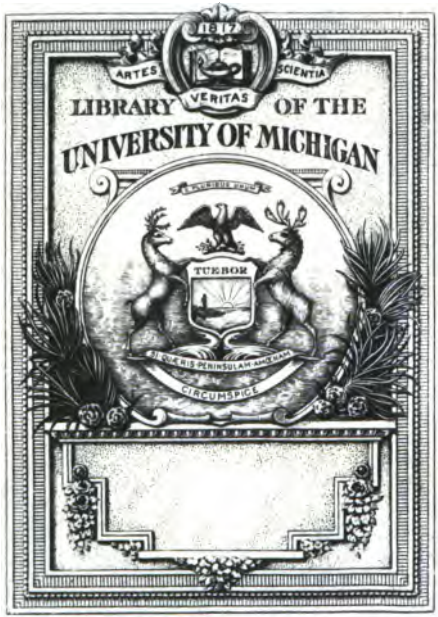

THE GIFT OF
Prof. Louis C. Karpinski

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1836

H.A.G.

THE

SURE GUIDE

TO

WRITTEN ARITHMETIC,

DESIGNED FOR

BEGINNERS, AND SUMMER SCHOOL

INSTRUCTION.

BY P. E. BATES BOTHAM,

AUTHOR OF THE "COMMON SCHOOL ARITHMETIC."

STEREOTYPE EDITION.

HARTFORD, CONN.

PUBLISHED AND FOR SALE BY R. WHITE; AND FOR SALE BY BOOKSELLERS AND COUNTRY MERCHANTS GENERALLY THROUGHOUT THE UNITED STATES.

1836.

NOTICE TO TEACHERS.

Two years since, the Author of this book published a *treatise* on numbers, entitled "BOTHAM'S COMMON SCHOOL ARITHMETIC." It was received by the public with universal approbation, and has been very highly recommended by many eminent men, and experienced instructors. This fact induced the subscribers to believe that a *Mental* system of Arithmetic, which would be a *sure* guide to WRITTEN, by the same author, could not fail of an unanimous approval—extensive circulation, and permanent support:—and would supply a desideratum, which has long existed in the publications of the day.

Mr. Botham having devoted several years to the study of mathematics: to the teaching of arithmetic; and spent much time in the careful examination of treatises on Arithmetic:—and has for the last eighteen months had personal consultations with very many intelligent and popular teachers; trusts he apprehends their wants, and has produced a manual of *Mental* Arithmetic, which will be a *sure guide to a system* of WRITTEN Arithmetic. He hopes he has rectified the misconceptions—corrected the errors—obviated the difficulties, and *very materially* improved on the works of others.

Fully sensible of the necessity of having an Arithmetic free from errors, the publishers and author have spared no pains in making this book as correct as possible. The proof-sheets have been revised with particular care, and every example re-examined with renewed attention, before the *Stereotype* plates were permitted to go to press. It is believed "*The only Sure Guide*" will, in point of correctness of execution, bear a comparison with any Arithmetic ever published in the United States.

The Publishers submit this work to the judgment of their *fellow citizens*—and all they presume to ask for it, is, that no person will pass sentence upon it, until he shall have given it a patient and candid examination.

Entered according to Act of Congress, in the year 1835, by HENRY HILLS, in the Clerk's Office of the District Court of Connecticut.

STEREOTYPED BY CONNER AND COOKE, NEW YORK.

Presented by Louis A. Carpenter
5/21/37

PREFACE.

THIS Manual is especially intended for beginners. It is confined to *Mental* Arithmetic, with a view to prepare the pupil for exercises in WRITTEN Arithmetic. It is confidently believed, that it will accomplish the object. I have long wished that such a system might be published and introduced into common schools as a standard branch of education; and no good reason can be given, why the study of this most interesting and useful science should be confined to a peculiar season of the year, and only taught by men. The upper classes, at least, in district and private schools, might be profitably instructed in its elements, without neglecting any of those branches to which children usually attend.

This book contains many investigations, and new discoveries relative to the best methods of instruction, not to be found in any other similar production extant. I have selected such materials as are decidedly good, and unexceptionable, and arranged them in such a manner as may render the gradation easy. I have endeavored to make the entire work as plain and intelligible as possible. There is no danger that the BEGINNER will find the study of Arithmetic *too* easy; or that it will require so little mental exertion, as not to be retained. Let the arrangement be ever so politic—let the explanations be as full as they may, still the *beginner* will find difficulties enough to exercise his mind. His abilities are insufficient fully to comprehend a Rule; and his progress can be promoted only by his teacher, and by having examples, in abstract numbers, wrought out, or the different parts of the operations placed in a conspicuous manner. I have aimed to prepare a work, which any child of ten or twelve years of age, who is unacquainted with the rudiments of arithmetic, can understand, with the aid of a teacher. And from

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which he will be able to acquire a *thorough* knowledge of the primary rules, both in *abstract* and CONCRETE numbers.

The following are the most important principles by which I have been governed in preparing this system of arithmetic:—

To introduce only such parts of the science as *properly* belong to an elementary work: to adhere strictly to a methodical arrangement, that can be easily understood and remembered: never to anticipate principles, so as to make a *clear* understanding of the subject, depend upon some explanation which is to follow: to introduce every new principle distinctly by itself, that the pupil may encounter but one difficulty at a time: to deduce the rules, generally, from practical exercises, and to state them distinctly and in form: to give a variety of questions for solution under each rule: to solve and fully explain all questions which involve a new principle, or the new application of a principle already explained. And, finally, to advance from simple to more difficult problems, in such a manner, as may fully exercise the powers of the pupil without discouraging him.

As this book professes to be merely an introduction to, and exercises in Arithmetic—it was deemed sufficient not to extend it beyond the rule of Practice. It is presumed, that in its present form, it contains as much of *Mental* Arithmetic as would be proper or advantageous for young learners to study.

Whether I have succeeded in my plan or not, must be decided by teachers: that a work of this kind is needed in the business of instruction, particularly for BEGINNERS, and in summer schools, is acknowledged by them, and it is on this account, I claim the indulgence and patronage of parents, teachers, and friends to improvement.

Hartford, May, 1835. THE AUTHOR.

*** The Author's Arithmetics are the only treatises that *implicitly* follow the orthography of Dr. WEBSTER; and agree with his "School Dictionary" and "Elementary Spelling Book."

N. B. My "Common School Arithmetic" contains 240 pages, and is for sale by the Booksellers in Hartford.

ARITHMETICAL TABLES.

ADDITION TABLE.

1	and	1	are	2	2	and	1	are	3	3	and	1	are	4
1	and	2	are	3	2	and	2	are	4	3	and	2	are	5
1	and	3	are	4	2	and	3	are	5	3	and	3	are	6
1	and	4	are	5	2	and	4	are	6	3	and	4	are	7
1	and	5	are	6	2	and	5	are	7	3	and	5	are	8
1	and	6	are	7	2	and	6	are	8	3	and	6	are	9
1	and	7	are	8	2	and	7	are	9	3	and	7	are	10
1	and	8	are	9	2	and	8	are	10	3	and	8	are	11
1	and	9	are	10	2	and	9	are	11	3	and	9	are	12
4	and	1	are	5	5	and	1	are	6	6	and	1	are	7
4	and	2	are	6	5	and	2	are	7	6	and	2	are	8
4	and	3	are	7	5	and	3	are	8	6	and	3	are	9
4	and	4	are	8	5	and	4	are	9	6	and	4	are	10
4	and	5	are	9	5	and	5	are	10	6	and	5	are	11
4	and	6	are	10	5	and	6	are	11	6	and	6	are	12
4	and	7	are	11	5	and	7	are	12	6	and	7	are	13
4	and	8	are	12	5	and	8	are	13	6	and	8	are	14
4	and	9	are	13	5	and	9	are	14	6	and	9	are	15
7	and	1	are	8	8	and	1	are	9	9	and	1	are	10
7	and	2	are	9	8	and	2	are	10	9	and	2	are	11
7	and	3	are	10	8	and	3	are	11	9	and	3	are	12
7	and	4	are	11	8	and	4	are	12	9	and	4	are	13
7	and	5	are	12	8	and	5	are	13	9	and	5	are	14
7	and	6	are	13	8	and	6	are	14	9	and	6	are	15
7	and	7	are	14	8	and	7	are	15	9	and	7	are	16
7	and	8	are	15	8	and	8	are	16	9	and	8	are	17
7	and	9	are	16	8	and	9	are	17	9	and	9	are	18

CARRYING TABLE.

1	1*		21	1	2	41	1	4	61	1	6	81	1	8
2	2		22	2	2	42	2	4	62	2	6	82	2	8
3	3		23	3	2	43	3	4	63	3	6	83	3	8
4	4		24	4	2	44	4	4	64	4	6	84	4	8
5	5		25	5	2	45	5	4	65	5	6	85	5	8
6	6		26	6	2	46	6	4	66	6	6	86	6	8
7	7		27	7	2	47	7	4	67	7	6	87	7	8
8	8		28	8	2	48	8	4	68	8	6	88	8	8
9	9		29	9	2	49	9	4	69	9	6	89	9	8
10	0	1	30	0	3	50	0	5	70	0	7	90	0	9
11	1	1	31	1	3	51	1	5	71	1	7	91	1	9
12	2	1	32	2	3	52	2	5	72	2	7	92	2	9
13	3	1	33	3	3	53	3	5	73	3	7	93	3	9
14	4	1	34	4	3	54	4	5	74	4	7	94	4	9
15	5	1	35	5	3	55	5	5	75	5	7	95	5	9
16	6	1	36	6	3	56	6	5	76	6	7	96	6	9
17	7	1	37	7	3	57	7	5	77	7	7	97	7	9
18	8	1	38	8	3	58	8	5	78	8	7	98	8	9
19	9	1	39	9	3	59	9	5	79	9	7	99	9	9
20	0	2	40	0	4	60	0	6	80	0	8	100	0	10

EXPLANATION. When a column of figures amount to 9 or a less sum, set down that figure. None to carry to the next column. If a column, when added, amount to 12, set down 2, carry 1.

* The pupil should learn this, and all the following tables, in such a perfect manner as to be able to repeat them readily.

SUBTRACTION TABLE.

1 from 1 leaves 0	2 from 2 leaves 0	3 from 3 leaves 0
1 from 2 leaves 1	2 from 3 leaves 1	3 from 4 leaves 1
1 from 3 leaves 2	2 from 4 leaves 2	3 from 5 leaves 2
1 from 4 leaves 3	2 from 5 leaves 3	3 from 6 leaves 3
1 from 5 leaves 4	2 from 6 leaves 4	3 from 7 leaves 4
1 from 6 leaves 5	2 from 7 leaves 5	3 from 8 leaves 5
1 from 7 leaves 6	2 from 8 leaves 6	3 from 9 leaves 6
1 from 8 leaves 7	2 from 9 leaves 7	3 from 10 leaves 7
1 from 9 leaves 8	2 from 10 leaves 8	3 from 11 leaves 8
1 from 10 leaves 9	2 from 11 leaves 9	3 from 12 leaves 9
4 from 4 leaves 0	5 from 5 leaves 0	6 from 6 leaves 0
4 from 5 leaves 1	5 from 6 leaves 1	6 from 7 leaves 1
4 from 6 leaves 2	5 from 7 leaves 2	6 from 8 leaves 2
4 from 7 leaves 3	5 from 8 leaves 3	6 from 9 leaves 3
4 from 8 leaves 4	5 from 9 leaves 4	6 from 10 leaves 4
4 from 9 leaves 5	5 from 10 leaves 5	6 from 11 leaves 5
4 from 10 leaves 6	5 from 11 leaves 6	6 from 12 leaves 6
4 from 11 leaves 7	5 from 12 leaves 7	6 from 13 leaves 7
4 from 12 leaves 8	5 from 13 leaves 8	6 from 14 leaves 8
4 from 13 leaves 9	5 from 14 leaves 9	6 from 15 leaves 9
7 from 7 leaves 0	8 from 8 leaves 0	9 from 9 leaves 0
7 from 8 leaves 1	8 from 9 leaves 1	9 from 10 leaves 1
7 from 9 leaves 2	8 from 10 leaves 2	9 from 11 leaves 2
7 from 10 leaves 3	8 from 11 leaves 3	9 from 12 leaves 3
7 from 11 leaves 4	8 from 12 leaves 4	9 from 13 leaves 4
7 from 12 leaves 5	8 from 13 leaves 5	9 from 14 leaves 5
7 from 13 leaves 6	8 from 14 leaves 6	9 from 15 leaves 6
7 from 14 leaves 7	8 from 15 leaves 7	9 from 16 leaves 7
7 from 15 leaves 8	8 from 16 leaves 8	9 from 17 leaves 8
7 from 16 leaves 9	8 from 17 leaves 9	9 from 18 leaves 9

BORROWING TABLE.

Take	1	from	0?	say,	1	from	10	leaves 9.
Take	2	from	0?	say,	2	from	10	leaves 8.
Take	2	from	1?	say,	2	from	11	leaves 9.
Take	3	from	0?	say,	3	from	10	leaves 7.
Take	3	from	1?	say,	3	from	11	leaves 8.
Take	3	from	2?	say,	3	from	12	leaves 9.
Take	4	from	0?	say,	4	from	10	leaves 6.
Take	4	from	1?	say,	4	from	11	leaves 7.
Take	4	from	2?	say,	4	from	12	leaves 8.
Take	4	from	3?	say,	4	from	13	leaves 9.
Take	5	from	0?	say,	5	from	10	leaves 5.
Take	5	from	1?	say,	5	from	11	leaves 6.
Take	5	from	2?	say,	5	from	12	leaves 7.
Take	5	from	3?	say,	5	from	13	leaves 8.
Take	5	from	4?	say,	5	from	14	leaves 9.
Take	6	from	0?	say,	6	from	10	leaves 4.
Take	6	from	1?	say,	6	from	11	leaves 5.
Take	6	from	2?	say,	6	from	12	leaves 6.
Take	6	from	3?	say,	6	from	13	leaves 7.
Take	6	from	4?	say,	6	from	14	leaves 8.
Take	6	from	5?	say,	6	from	15	leaves 9.
Take	7	from	0?	say,	7	from	10	leaves 3.
Take	7	from	1?	say,	7	from	11	leaves 4.
Take	7	from	2?	say,	7	from	12	leaves 5.
Take	7	from	3?	say,	7	from	13	leaves 6.
Take	7	from	4?	say,	7	from	14	leaves 7.
Take	7	from	5?	say,	7	from	15	leaves 8.

Obs. This table should be committed to memory by the pupils.

BORROWING TABLE.

Take	7	from	6?	say,	7	from	16	leaves 9.
Take	8	from	0?	say,	8	from	10	leaves 2.
Take	8	from	1?	say,	8	from	11	leaves 3.
Take	8	from	2?	say,	8	from	12	leaves 4.
Take	8	from	3?	say,	8	from	13	leaves 5.
Take	8	from	4?	say,	8	from	14	leaves 6.
Take	8	from	5?	say,	8	from	15	leaves 7.
Take	8	from	6?	say,	8	from	16	leaves 8.
Take	8	from	7?	say,	8	from	17	leaves 9.
Take	9	from	0?	say,	9	from	10	leaves 1.
Take	9	from	1?	say,	9	from	11	leaves 2.
Take	9	from	2?	say,	9	from	12	leaves 3.
Take	9	from	3?	say,	9	from	13	leaves 4.
Take	9	from	4?	say,	9	from	14	leaves 5.
Take	9	from	5?	say,	9	from	15	leaves 6.
Take	9	from	6?	say,	9	from	16	leaves 7.
Take	9	from	7?	say,	9	from	17	leaves 8.
Take	9	from	8?	say,	9	from	18	leaves 9.

Note to Teachers.—Let the pupils consult the above table when performing operations in subtraction. It will aid in the solution.

MULTIPLICATION TABLE.

1 once 0 is 0	4 times 0 are 0	7 times 0 are 0
1 once 1 is 1	4 times 1 are 4	7 times 1 are 7
1 once 2 is 2	4 times 2 are 8	7 times 2 are 14
1 once 3 is 3	4 times 3 are 12	7 times 3 are 21
1 once 4 is 4	4 times 4 are 16	7 times 4 are 28
1 once 5 is 5	4 times 5 are 20	7 times 5 are 35
1 once 6 is 6	4 times 6 are 24	7 times 6 are 42
1 once 7 is 7	4 times 7 are 28	7 times 7 are 49
1 once 8 is 8	4 times 8 are 32	7 times 8 are 56
1 once 9 is 9	4 times 9 are 36	7 times 9 are 63
2 times 0 are 0	5 times 0 are 0	8 times 0 are 0
2 times 1 are 2	5 times 1 are 5	8 times 1 are 8
2 times 2 are 4	5 times 2 are 10	8 times 2 are 16
2 times 3 are 6	5 times 3 are 15	8 times 3 are 24
2 times 4 are 8	5 times 4 are 20	8 times 4 are 32
2 times 5 are 10	5 times 5 are 25	8 times 5 are 40
2 times 6 are 12	5 times 6 are 30	8 times 6 are 48
2 times 7 are 14	5 times 7 are 35	8 times 7 are 56
2 times 8 are 16	5 times 8 are 40	8 times 8 are 64
2 times 9 are 18	5 times 9 are 45	8 times 9 are 72
3 times 0 are 0	6 times 0 are 0	9 times 0 are 0
3 times 1 are 3	6 times 1 are 6	9 times 1 are 9
3 times 2 are 6	6 times 2 are 12	9 times 2 are 18
3 times 3 are 9	6 times 3 are 18	9 times 3 are 27
3 times 4 are 12	6 times 4 are 24	9 times 4 are 36
3 times 5 are 15	6 times 5 are 30	9 times 5 are 45
3 times 6 are 18	6 times 6 are 36	9 times 6 are 54
3 times 7 are 21	6 times 7 are 42	9 times 7 are 63
3 times 8 are 24	6 times 8 are 48	9 times 8 are 72
3 times 9 are 27	6 times 9 are 54	9 times 9 are 81

DIVISION TABLE.

2	in	2	1	once	5	in	5	1	once	8	in	8	1	once
2	in	4	2	times	5	in	10	2	times	8	in	16	2	times
2	in	6	3	times	5	in	15	3	times	8	in	24	3	times
2	in	8	4	times	5	in	20	4	times	8	in	32	4	times
2	in	10	5	times	5	in	25	5	times	8	in	40	5	times
2	in	12	6	times	5	in	30	6	times	8	in	48	6	times
2	in	14	7	times	5	in	35	7	times	8	in	56	7	times
2	in	16	8	times	5	in	40	8	times	8	in	64	8	times
2	in	18	9	times	5	in	45	9	times	8	in	72	9	times
3	in	3	1	once	6	in	6	1	once	9	in	9	1	once
3	in	6	2	times	6	in	12	2	times	9	in	18	2	times
3	in	9	3	times	6	in	18	3	times	9	in	27	3	times
3	in	12	4	times	6	in	24	4	times	9	in	36	4	times
3	in	15	5	times	6	in	30	5	times	9	in	45	5	times
3	in	18	6	times	6	in	36	6	times	9	in	54	6	times
3	in	21	7	times	6	in	42	7	times	9	in	63	7	times
3	in	24	8	times	6	in	48	8	times	9	in	72	8	times
3	in	27	9	times	6	in	54	9	times	9	in	81	9	times
4	in	4	1	once	7	in	7	1	once	10	in	10	1	once
4	in	8	2	times	7	in	14	2	times	10	in	20	2	times
4	in	12	3	times	7	in	21	3	times	10	in	30	3	times
4	in	16	4	times	7	in	28	4	times	10	in	40	4	times
4	in	20	5	times	7	in	35	5	times	10	in	50	5	times
4	in	24	6	times	7	in	42	6	times	10	in	60	6	times
4	in	28	7	times	7	in	49	7	times	10	in	70	7	times
4	in	32	8	times	7	in	56	8	times	10	in	80	8	times
4	in	36	9	times	7	in	63	9	times	10	in	90	9	times

MULTIPLICATION TABLE.

10 times 1 are 10	11 times 1 are 11	12 times 1 are 12
10 times 2 are 20	11 times 2 are 22	12 times 2 are 24
10 times 3 are 30	11 times 3 are 33	12 times 3 are 36
10 times 4 are 40	11 times 4 are 44	12 times 4 are 48
10 times 5 are 50	11 times 5 are 55	12 times 5 are 60
10 times 6 are 60	11 times 6 are 66	12 times 6 are 72
10 times 7 are 70	11 times 7 are 77	12 times 7 are 84
10 times 8 are 80	11 times 8 are 88	12 times 8 are 96
10 times 9 are 90	11 times 9 are 99	12 times 9 are 108
10 times 10 are 100	11 times 10 are 110	12 times 10 are 120
10 times 11 are 110	11 times 11 are 121	12 times 11 are 132
10 times 12 are 120	11 times 12 are 132	12 times 12 are 144

FEDERAL MONEY.

10 Mills - - -	make - -	1 Cent.
10 Cents - - -	make - -	1 Dime.
10 Dimes, or 100 Cents, -	make - -	1 Dollar.
10 Dollars - - -	make - -	1 Eagle.
5 Dollars - - -	make - -	1 half Eagle.
2 and one half Dollars -	make - -	one quarter Eagle

MERCHANTABLE GRAIN.

Wheat	60 lb.	to the bushel.
Rye,	58 do.	
Barley,	48 do.	
Oats,	34 do.	

FIGURES.

1 one,	2 two,	3 three,	4 four,	5 five.
2	1	4	3	5

6 six,	7 seven,	8 eight,	9 nine,	0 naught; A character.
9	8	7	6	

10 ten,	11 eleven,	12 twelve,	13 thirteen,	14 fourteen,	15 fifteen.
14	10	13	11	15	12

16 sixteen,	17 seventeen,	18 eighteen,	19 nineteen,	20 twenty.
19	16	17	18	20

21 twenty-one,	22 twenty-two,	23 twenty-three,	24 twenty-four,	25 twenty-five.
23	25	24	22	21

26 twenty-six,	27 twenty-seven,	28 twenty-eight,	29 twenty-nine,	30 thirty.
28	30	27	26	29

31 thirty-one,	32 thirty-two,	33 thirty-three,	34 thirty-four,	35 thirty-five.
34	31	32	35	33

36 thirty-six,	37 thirty-seven,	38 thirty-eight,	39 thirty-nine,	40 forty.
39	36	40	38	37

41 forty-one,	42 forty-two,	43 forty-three,	44 forty-four,	45 forty-five.
44	41	42	45	43

46 forty-six,	47 forty-seven,	48 forty-eight,	49 forty-nine,	50 fifty.
48	46	50	47	49

51 fifty-one,	52 fifty-two,	53 fifty-three,	54 fifty-four,	55 fifty-five.
53	51	54	52	55

56 fifty-six,	57 fifty-seven,	58 fifty-eight,	59 fifty-nine,	60 sixty.
58	56	60	57	59

61 sixty-one,	62 sixty-two,	63 sixty-three,	64 sixty-four,	65 sixty-five.
63	65	62	61	64
66 sixty-six,	67 sixty-seven,	68 sixty-eight,	69 sixty-nine,	70 seventy.
68	66	69	67	70
71 seventy-one,	72 seventy-two,	73 seventy-three,	74 seventy-four,	75 seventy-five.
73	75	72	71	74
76 seventy-six,	77 seventy-seven,	78 seventy-eight,	79 seventy-nine,	80 eighty.
78	80	76	77	79
81 eighty-one,	82 eighty-two,	83 eighty-three,	84 eighty-four,	85 eighty-five.
83	85	82	84	81
86 eighty-six,	87 eighty-seven,	88 eighty-eight,	89 eighty-nine,	90 ninety.
88	86	89	90	87
91 ninety-one,	92 ninety-two,	93 ninety-three,	94 ninety-four,	95 ninety-five.
93	91	95	92	94

96 ninety-six, 97 ninety-seven, 98 ninety-eight, 99 ninety-nine, 100 one hundred.

☞ Lessons to be read by the pupils in classes.

21	15	8	20	3	74
10	23	7	38	8	70
56	10	3	43	7	85
74	14	9	20	6	90
30	38	1	57	8	68
91	16	4	40	2	87
45	27	6	29	4	96
63	11	5	55	5	37
80	19	8	30	9	100

QUESTIONS.

What figure and character stand for ten?—for twenty?—for thirty?—forty?—fifty?—sixty?—seventy?—eighty?—ninety? What figures stand for twelve?—eighteen?—twenty-seven?—thirty-three?—forty-nine?—fifty-eight?—sixty-four?—seventy-six?—eighty-two?

☞ Lessons to be read by the pupils in classes.

1 4	2 1	2 5	1 1	1 0
2 8	3 1	4 3	2 2	8 0
4 2	4 2	6 1	3 0	3 0
5 6	5 2	7 9	6 4	7 0
6 9	6 2	9 6	0 0	2 0
8 3	7 3	1 4	3 8	5 0
9 7	8 3	2 9	6 7	4 0
1 1	9 4	4 3	0 0	6 0
2 5	1 4	5 7	3 3	9 0
3 9	6 4	7 1	6 1	2 0
5 8	2 5	8 6	0 0	7 0
6 7	5 0	0 0	3 3	3 0
3 8	7 5	1 4	6 7	1 0
9 0	0 0	2 9	9 0	4 0
6 6	2 6	4 3	3 3	7 0
3 3	5 0	5 7	6 5	3 0
0 0	7 5	7 4	0 0	5 0
6 7	2 5	8 6	3 4	2 0

QUESTIONS.

What figures stand for fourteen?—for eighty-three?—for thirty-nine?—for sixty-one? Name the figures that stand for twenty-five,—for eighty six,—for thirty-three. What do six and seven stand for?—four and three?—seven and one?—three and nine? One and a 0 express what number?—eight and a 0 what?—four and a 0 what? Tell what stands for seventy—for twenty—for sixty—for fifty—for ten.

The local and relative value of figures can be learned by the following lessons

LESSON I.

101 one hundred and one.
102 one hundred and two.
105 one hundred and five.
107 one hundred and seven.
108 one hundred and eight.
109 one hundred and nine.
103 one hundred and three.
106 one hundred and six.
104 one hundred and four.
307 three hundred and seven.
409 four hundred and nine.
508 five hundred and eight.
607 six hundred and seven.
603 six hundred and three.
708 seven hundred and eight.
807 eight hundred and seven.
903 nine hundred and three.

110 one hundred ten.
130 one hundred thirty.
160 one hundred sixty.
180 one hundred eighty.
190 one hundred ninety.
150 one hundred fifty.
170 one hundred seventy.
120 one hundred twenty.
270 two hundred seventy.
230 two hundred thirty.
140 one hundred forty.
160 one hundred sixty.
100 one hundred.
730 seven hundred thirty.
200 two hundred.
400 four hundred.
500 five hundred.

LESSON II.

111 one hundred eleven.
113 one hundred thirteen.
117 one hundred seventeen.
114 one hundred fourteen.
118 one hundred eighteen.
121 one hundred twenty-one.
131 one hundred thirty-one.
164 one hundred sixty-four.
191 one hundred ninety-one.
171 one hundred seventy-one.
151 one hundred fifty-one.
138 one hundred thirty-eight.
173 one hundred seventy-three.

321 three hundred twenty-one.
875 eight hundred seventy-five.
384 three hundred eighty-four.
327 three hundred twenty-seven.
372 three hundred seventy-two.
468 four hundred sixty-eight.
537 five hundred thirty-seven.
749 seven hundred forty-nine.
717 seven hundred seventeen.
863 eight hundred sixty-three.
937 nine hundred thirty-seven.
785 seven hundred eighty-five.

☞ Lessons to be read by the pupils in classes.

104	200	466	309
117	210	664	971
109	300	391	530
127	400	940	463
145	500	978	347
120	600	356	463
180	700	987	620
105	800	529	217
199	900	632	128
101	552	621	913
107	444	473	758
113	786	763	234
147	369	879	127
169	814	873	217
183	372	243	326
130	528	879	436

QUESTIONS.

Name the figures that stand for 1 hundred and four—for 1 hundred and nine—or 1 hundred and one—for 1 hundred and seven—for 3 hundred and two—for 1 hundred and eight—for 1 hundred and five. What figures stand for 1 hundred twenty—for 1 hundred ten—for 1 hundred forty—for 5 hundred thirty—for 8 hundred seventy—for 6 hundred twenty—for 9 hundred forty—for 1 hundred thirty? Name the figures that stand for 1 hundred thirteen—for 1 hundred twelve—for 3 hundred forty-three—for 6 hundred nineteen—for 3 hundred eighty-one—for 7 hundred sixty-three—for 1 hundred thirty-five.

APPLICATION.

3 feet make 1 yard. 12 inches make 1 foot.
4 weeks make 1 month. 12 months make 1 year.
6 shillings make 1 dollar. 7 days make 1 week.
8 quarts make 1 peck. 30 days make 1 month.
20 grains make 1 scruple. 24 grains make 1 pennyweight.
30 degrees make 1 sign. 36 bushels make 1 chaldron.
60 minutes make 1 hour. 40 rods make 1 furlong.
4 nails make 1 quarter of a yard. 31½ gallons make 1 barrel.
2 pipes make 1 tun. 4 quarters make 1 yard.
144 square inches make 1 square foot. 4 pecks make 1 bushel.
63 gallons make 1 hogshead. 12 ounces make 1 pound.
128 solid feet make 1 cord of wood. A cord foot is 16 solid feet.
24 hours make 1 day. 365 days make 1 year.
69½ statute miles make 1 degree on the earth.
9 square feet make 1 square yard. 8 furlongs make 1 mile.
4 quarts make 1 gallon. 2 pints make 1 quart. 4 gills make 1 pint
4 pecks make 1 bushel. 8 drams make 1 ounce.
16 drams make 1 ounce. 16 ounces make 1 pound.
25 pounds make 1 quarter of a hundred weight.
4 quarters make 1 hundred weight. 20 hundred 1 tun.
20 pennyweights make 1 ounce. 5½ yards make 1 rod.
3 scruples make 1 dram. 3 quarters make 1 ell flemish.
2 hogsheads make 1 pipe. 3 barley corns make 1 inch.
3 miles make 1 league. 40 square poles 1 rood.
640 acres make 1 square mile. 4 roods make 1 acre.
12 things make 1 dozen. 12 dozen 1 gross. 20 quires 1 reams
10 dollars make 1 eagle. 5 dollars is a half eagle.
10 mills make 1 cent. 10 cents make 1 dime.
10 dimes make 1 dollar. 100 years is a century.

NUMERATION

TELLS the value of figures. Numerating is finding the value. When we numerate, we begin at the right hand, and go to the left.

The first figure is			Units.
" second figure is			Tens.
" third figure is			Hundreds.
Therefore the figures	3	2	4
are numerated, thus:	Hundreds,	Tens,	Units.

☞ Let the pupils numerate the following figures, as above.

6 3 2	6 3 8	2 3 4	6 8 7
5 7 3	7 8 3	3 4 7	4 3 2
7 6 4	3 4 7	4 6 2	3 7 8

One figure standing alone, is called Units, 2
Two figures standing together, are called Units, tens, 32
Three figures " " " Units, tens, hundreds, 432
The fourth figure is . . . . Thousands.
" fifth figure is . . . . Tens of thousands.
" sixth figure is . . . . Hundreds of thousands.
Therefore the figures 8 1 5
are numerated, thus: 100s of thou., 10s of thou., Thousands, Hun-
3 2 4
dreds, Tens, Units.

☞ Let the pupils numerate the following figures, as above.

6475	32541	975815	778045
1424	41352	855927	798372
3247	24135	687102	947894

Four figures standing together are numerated, Units, tens, hundreds, thousands, 5324.

Five figures.—Units, tens, hundreds, thousands, tens of thousands, 15324.

Six figures,—Units, tens, hundreds, thousands, tens of thousands, 100 of thousands, 815324.

Obs. We numerate and read numbers, as follows.

1 Units, *one.*

2 1 Units, tens; *twenty-one.*

3 2 1 Units, tens, hundreds; *three hundred twenty-one.*

4 3 2 1 Units, tens, hundreds, thousands; *four thousand three hundred twenty-one.*

5 4 3 2 1 Units, tens, hundreds, thousands, tens of thousands *fifty-four thousand three hundred twenty-one.*

6 5 4 3 2 1 Units, tens, hundreds, thousands, tens of thousands, hundreds of thousands; *six hundred fifty-four thousand three hundred twenty-one.*

☞ Let the pupil numerate and read the following figures, as above

347247	147324	896719
678428	475325	758958
824326	419876	421475

To numerate and name the units of each order.

Rule: Begin at the right hand, name the value of each figure and its order separately.

Ex. Numerate 4 6 7 and 3 8 6.
hundred 4, tens 6, units 7; hundred 3, tens 8, units 6.

☞ Let the pupils numerate the following figures, as above.

732	152	224	473
645	234	324	984
816	215	673	863

NUMERATION TABLE.

Hundred, of trillions	Tens of trillions	TRILLIONS	Hundreds, of billions	Tens of billions	BILLIONS	Hundred, of millions	Tens of millions	MILLIONS	Hundred, of thousands	Tens of thousands	THOUSANDS	Hundreds	Tens	UNITS
4	7	2	1	5	6	7	9	5	8	4	1	5	2	6

To read the line of figures in this table, begin with the left hand figure, and proceed as follows:

Four hundred seventy-two *Trillion*,	one hundred fifty-six *Billion*,	seven hundred ninety-five *Million*,	eight hundred forty-one *Thousand*,	five hundred twenty-six.
4 7 2	1 5 6	7 9 5	8 4 1	5 2 6

RULE FOR READING WHOLE NUMBERS.

Find out the place of each figure by the Table, and to the simple value of each figure join the name of its place, beginning at the left hand, and reading towards the right.

To read large numbers they are divided into periods of three figures each, as the following.

5th Period or Period of Trillions.	4th Period or Period of Billions.	3d Period or Period of Millions.	2d Period or Period of Thousands.	1st Period or Period of Units.
912,	761,	257,	327,	826.

1.	Read the number,		508	19.	Read the number,		10,0
2.	"	"	3,861	20.	"	"	90,0
3.	"	"	1,050	21.	"	"	107,0
4.	"	"	27,400	22.	"	"	6,3
5.	"	"	13,008	23.	"	"	10,0
6.	"	"	29,111	24.	"	"	100,0
7	"	"	112,600	25.	"	"	220,0
8.	"	"	30,030	26.	"	"	333,1
9.	"	"	206,209	27.	"	"	90,9
10.	"	"	500,088	28.	"	"	1,0
11.	"	"	432,040	29.	"	"	331,5
12.	"	"	200,005	30.	"	"	9,0
13.	"	"	70,638	31.	"	"	700,0
14.	"	"	18,103	32.	"	"	1,6
15.	"	"	974,036	33.	"	"	8,0
16	"	"	7,140	34	"	"	22,0
17.	"	"	31,032	35.	"	"	900,0
18.	"	"	8,000	36.	"	"	100,0

Obs. This character, 0, called *naught*, or *cipher*, expresses nothing itself—it stands only to occupy a place, where no value is to be expressed. For example, in the number 240, there are no units; therefore a cipher stands in the units' place. In the number 407, there are no tens; therefore a cipher stands in the tens' place, and the 0 removes the 4 one place farther from units' place.

1.	Read the number,		1,000
2.	"	"	3,000
3.	"	"	3,500
4.	"	"	4,050
5.	"	"	7,006
6.	"	"	8,044
7.	"	"	4,704
8.	"	"	1,004
9.	"	"	10,000
10.	"	"	40,000
11.	"	"	45,000
12.	"	"	40,500
13.	"	"	40,050
14.	"	"	40,005
15.	"	"	42,300
16.	"	"	34,030
17.	"	"	43,003
18.	"	"	50,057
19.	"	"	50,570
20.	"	"	57,050
21.	"	"	800,475
22.	"	"	804,750
23.	"	"	847,500
24.	"	"	840,075
25.	"	"	840,750
26.	"	"	806,700
27.	"	"	860,507
28.	"	"	966,470
29.	"	"	100,000
30.	"	"	409,000

NOTATION

Is expressing numbers by figures. This may be done by telli
what figures stand for a given number, thus: what figures stand f
twelve? one, two, written 12. Or how would you write *twenty-*
ven? Ans. Write two, then seven, thus: 27.

RULE:—Name the first figure of the highest order, then the n
lower, and so on to the unit figure of the first period.

☞ Name the figures that stand for the following numbers:

Ninety-five. One hundred. Two hundred and five. Eight hu
dred twenty-seven. Six hundred and eight. Nine hundred fort
six. Seven hundred and seven. One hundred nineteen. T
hundred and one. Four hundred and nine. Two hundred a
seven. Nine hundred and eight. Nine hundred eighty. Thr
hundred and six. Three hundred fifteen. Four hundred and five. S
ven hundred eighty-four. Six hundred and nine. Nine hundr
twelve. Seven hundred. Four hundred. Two hundred. Thr
hundred ten. Seven hundred twenty. One hundred thirty. Fo
hundred forty. Five hundred fifty.

LESSON I.

Name One Hundred.*
Two Hundred.
Four Hundred.
Ninety.
Eighty.
Sixty.
Seventy.
Eighty-one.
Ninety-three.
Fifty-three.

Name Two Hundred Fifty.
Five Hundred Forty.
Three Hundred Thirty.
Six Hundred.
Nine Hundred Sixty.
Eight Hundred Fifty.
One Hundred Twenty.
Nine Hundred and Four.
Six Hundred and Nine.
Four Hundred Ten.

LESSON II.

Name Four Hundred Twenty.
Five Hundred Forty-four.
Six Hundred and Seven.
Eight Hundred.
Forty-four.
Sixty-five.
Six Hundred Forty-eight.
Nineteen.

Name Seven Hundred Sixty-nine.
Eight Hundred Eighty-two.
Five Hundred and Six.
Six Hundred Forty.
Four Hundred Seventy-five.
Seven Hundred Ninety-four.
Eight Hundred Forty-four.
Nine Hundred Sixty-two.

LESSON III.

One Thousand.
Two Thousand Six Hundred.
Three Thousand Four Hundred.
Eight Thousand and Fifty.
Five Thousand and Nine.
Eight Thousand and Eight.
Seven Thousand Four Hundred.

Two Thousand Three Hundred.
Four Thousand Six Hundred.
Three Thousand Two Hundred.
Five Hundred and Forty-four.
Six Hundred and Fifty-two.
Eight Hundred and Sixty-nine.
One Hundred Sixteen.

* That is, tell the figures that stand for "one hundred," thus: *one, two ciphers.*

ADDITION

MEANS the putting of two or more numbers into one sum.

Figures are numbers. The numbers are called parts.

The one sum is the answer or the amount.

You can tell the amount of any two figures by the following

ADDITION TABLE.

1 and 1 are 2	2 and 2 are 4	3 and 3 are 6	4 and 4 are
9 and 1 are 10	1 and 2 are 3	1 and 3 are 4	1 and 4 are
1 and 8 are 9	2 and 3 are 5	3 and 2 are 5	5 and 4 are
5 and 1 are 6	4 and 2 are 6	4 and 3 are 7	4 and 8 are 1
1 and 4 are 5	2 and 8 are 10	3 and 1 are 4	6 and 4 are 1
3 and 1 are 4	9 and 2 are 11	7 and 3 are 10	8 and 4 are 1
1 and 7 are 8	2 and 7 are 9	3 and 6 are 9	2 and 4 are
6 and 1 are 7	2 and 4 are 6	5 and 3 are 8	4 and 5 are
1 and 9 are 10	7 and 2 are 9	3 and 4 are 7	9 and 4 are 1
7 and 1 are 8	6 and 2 are 8	6 and 3 are 9	4 and 7 are 1
1 and 6 are 7	2 and 1 are 3	3 and 5 are 8	4 and 9 are 1
4 and 1 are 5	3 and 2 are 5	2 and 3 are 5	3 and 4 are
1 and 3 are 4	2 and 5 are 7	3 and 9 are 12	4 and 2 are
8 and 1 are 9	8 and 2 are 10	8 and 3 are 11	7 and 4 are 1
1 and 5 are 6	5 and 2 are 7	3 and 7 are 10	4 and 6 are 1
2 and 1 are 3	2 and 6 are 8	9 and 3 are 12	4 and 3 are
1 and 2 are 3	2 and 9 are 11	3 and 8 are 11	4 and 1 are

5 and 5 are 10	6 and 8 are 14	7 and 2 are 9	8 and 2 are 10
1 and 5 are 6	4 and 6 are 10	3 and 7 are 10	6 and 8 are 14
5 and 6 are 11	6 and 9 are 15	5 and 7 are 12	9 and 8 are 17
7 and 5 are 12	8 and 6 are 14	7 and 4 are 11	8 and 5 are 13
5 and 2 are 7	6 and 5 are 11	2 and 7 are 9	9 and 8 are 17
3 and 5 are 8	2 and 6 are 8	7 and 5 are 12	9 and 9 are 18
5 and 9 are 14	6 and 1 are 7	7 and 6 are 13	3 and 9 are 12
4 and 5 are 9	7 and 6 are 13	4 and 7 are 11	9 and 6 are 15
5 and 1 are 6	6 and 3 are 9	8 and 8 are 16	5 and 9 are 14
8 and 5 are 13	9 and 6 are 15	8 and 1 are 9	9 and 7 are 16
5 and 3 are 8	6 and 4 are 10	1 and 8 are 9	1 and 9 are 10
2 and 5 are 7	6 and 3 are 9	8 and 7 are 15	9 and 3 are 12
5 and 7 are 12	6 and 2 are 8	3 and 8 are 11	8 and 9 are 17
6 and 5 are 11	7 and 7 are 14	8 and 4 are 12	4 and 9 are 13
5 and 8 are 13	1 and 7 are 8	2 and 8 are 10	9 and 2 are 11
9 and 5 are 14	7 and 8 are 15	8 and 9 are 17	7 and 9 are 16
5 and 4 are 9	9 and 7 are 16	5 and 8 are 13	9 and 4 are 13
6 and 6 are 12	7 and 1 are 8	8 and 3 are 11	9 and 1 are 10
1 and 6 are 7	8 and 7 are 15	7 and 8 are 15	2 and 9 are 11
6 and 7 are 13	7 and 3 are 10	4 and 8 are 12	9 and 5 are 14
5 and 6 are 11	6 and 7 are 13	8 and 6 are 14	6 and 9 are 15

QUESTIONS

To be asked by the teacher and answered by the pupils.

2 and 1 are	3 and 1 are	4 and 1 are	5 and 1 are
2 and 2 are	3 and 2 are	4 and 2 are	5 and 2 are
2 and 3 are — How many?	3 and 3 are — How many?	4 and 3 are — How many?	5 and 3 are — How many?

2 and 4 are	3 and 4 are	4 and 4 are	5 and 4 are
2 and 5 are	3 and 5 are	4 and 5 are	5 and 5 are
2 and 6 are	3 and 6 are	4 and 6 are	5 and 6 are
2 and 7 are	3 and 7 are	4 and 7 are	5 and 7 are
2 and 8 are	3 and 8 are	4 and 8 are	5 and 8 are
2 and 9 are	3 and 9 are	4 and 9 are	5 and 9 are
How many?	How many?	How many?	How many?

6 and 1 are	7 and 1 are	8 and 1 are	9 and 1 are
6 and 2 are	7 and 2 are	8 and 2 are	9 and 2 are
6 and 3 are	7 and 3 are	8 and 3 are	9 and 3 are
6 and 4 are	7 and 4 are	8 and 4 are	9 and 4 are
6 and 5 are	7 and 5 are	8 and 5 are	9 and 5 are
6 and 6 are	7 and 6 are	8 and 6 are	9 and 6 are
6 and 7 are	7 and 7 are	8 and 7 are	9 and 7 are
6 and 8 are	7 and 8 are	8 and 8 are	9 and 8 are
6 and 9 are	7 and 9 are	8 and 9 are	9 and 9 are
How many?	How many?	How many?	How many?

9 and 4	9 and 6	8 and 6	9 and 5
6 and 3	8 and 1	5 and 3	7 and 3
8 and 5	6 and 6	0 and 9	4 and 4
2 and 2	0 and 8	8 and 8	0 and 3
0 and 4	5 and 4	6 and 4	8 and 4
7 and 7	8 and 2	9 and 2	5 and 2
4 and 1	3 and 2	0 and 6	7 and 4
9 and 7	9 and 3	3 and 3	0 and 5
5 and 5	7 and 6	7 and 2	8 and 7
0 and 1	6 and 5	4 and 3	6 and 2
9 and 8	0 and 2	7 and 5	8 and 3
4 and 2	9 and 9	0 and 7	0 and 1
Are how many?	Are how many?	Are how many?	Are how many?

Addition of Simple Numbers.

Add

4	3	2	3	4	6	3	7	4	3
3	5	6	7	5	2	5	4	5	8
3	5	2	9	7	3	4	7	9	6
6	2	8	4	5	6	8	5	8	3

Add

1.)	2.)	3.)	4.)	5.)	6.)
2	4	4	3	3	1
3	3	1	1	2	3
1	2	2	4	3	2
7.)	**8.)**	**9.)**	**10.)**	**11.)**	**12.)**
1	1	3	2	1	4
2	3	4	3	4	2
3	2	1	1	2	1

13.)	14.)	15.)	16.)	17.)
10	10	17	24	13
11	12	15	31	41
12	14	14	42	24
18.)	**19.)**	**20.)**	**21.)**	**22.)**
24	42	63	17	24
32	42	21	28	36
13	33	15	46	47
23.)	**24.)**	**25.)**	**26.)**	**27.)**
34	96	63	24	34
75	89	21	14	34
57	75	15	13	47

ANSWERS.

1.)	6	2.)	9	3.)	7	4.)	8	5.)	8	6.)	6
7.)	6	8.)	6	9.)	8	10.)	6	11.)	7	12.)	7
13.)	33	14.)	36	15.)	46	16.)	97	17.)	78		
18.)	69	19.)	117	20.)	99	21.)	91	22.)	107		
23.)	166	24.)	260	25.)	99	26.)	51	27.)	115		

28.)
57
64
79

29.)
341
242
345

30.)
241
423
132

31.)
215
142
434

32.)
245
456
475

33.)
52
76
41

34.)
251
143
314

35.)
521
242
415

36.)
354
251
413

37.)
747
645
474

38.)
685
527
153

39.)
147
458
198

40.)
465
957
531

41.)
3125
2531
1452

42.)
2514
4352
1435

43.)
5740
4531
4756

44.)
9676
7803
6175

45.)
3142
2314
5344

46.)
4756
4324
2413

47.)
4745
6745
3487
8521

48.)
6746
3151
2435
5314

49.)
3478
2432
3215
1478

50.)
7567
4898
7832
4741

51.)
9878570
8765965
1427482

52.)
86572171
49436248
55758462

53.)
4743467
5474341
4789328

ANSWERS.

28.)	200.	29.)	928	30.)	796	31.)	791	32.)	1176
33.)	169	34.)	708	35.)	1178	36.)	1018	37.)	1866
38.)	1365	39.)	803	40.)	1953	41.)	7108	42.)	8301
43.)	15027	44.)	23654	45.)	10800	46.)	11493		
47.)	23498	48.)	17646	49.)	10603	50.)	25038		
51.)	20072017	52.)	191766381			53.)	15007136		

The pupil is now prepared to understand the following

EXPLANATIONS AND RULE.

ADDITION is finding a *single number*, which shall express the amount of TWO OR MORE NUMBERS in one sum.

The single number, thus found, is called AMOUNT or SUM total.

The adding of one for every *ten* to the next column, is called CARRYING.

RULE:—Begin at the foot of the right hand column, find its amount; if units, place it directly under that order—if units and tens, put the units down, and add the tens to the next column. At the last column name its whole sum.

QUESTIONS.

WHAT is addition? What is the amount or sum total?
What is carrying? Give an example. For 12 how many? for 15, 16, 17, for 20, 30, 40, 50, 60, 70, 80, 90, 100?
Where do you begin to add? When the sum of a column can be expressed by one figure, what do you do?
When it cannot be so expressed, what is done?
What is carried to the next column, units or tens?
What is set down under the last column?
What is a column? *Ans.* A perpendicular line of figures.
What is a row? Figures ranged in a *right* line.
What is a number? One or more units.
What is a unit? Any single thing, or the figure 1.

☞ Let the pupil do the following sums *orally*.

FORM.

1. In a school, 10 study history, 11 geography, and 15 grammar. How many scholars in the whole?
Ans. 36.

10
11
15
36

2. Five boys went to market with apples; A. sold his for 35 cents; B. his for 32; C. his for 28; D. his for 22; and E. his for 21. How much money did they all receive?
Ans. 138 *cents.*

35
32
28
22
21
138

3. A man bought 4 pieces of cloth, containing, the first, 60 yards; the second, 97; the third, 82; and the fourth, 112. How many yards in all?
Ans. 351 *yds.*

60
97
82
112
351

4. A farmer sold a horse for 75 dollars, a cow for 30 dollars, and a sheep for 5 dollars. How many dollars did he get for the whole?
Ans. 110 *dols.*

75
30
5
110

5. A farmer raised in one year 120 bushels of wheat; 85 bushels of Indian corn; 100 bushels of oats; 86 bushels of barley; and 74 bushels of pease. What was the whole amount?
Ans. 465 *bush.*

120
85
100
86
74
465

6. A mercnant bought a quantity of sugar for 2075 dollars, and then sold it so as to gain 415 dollars. For how much did he sell the sugar?
Ans. 2490 *dols.*

7. A merchant, on settling his accounts, finds that he owes A. 60 dollars; B. 150 dollars; C. 240 dollars; and to D. 100 dollars. How much does he owe in all?
Ans. 550 *dols.*

8. A man has 25 sheep in one field; 37 in another field; and 18 in his yard. How many sheep has he in all?
Ans. 80.

9. A carpenter paid 31 dollars for boards; 10 dollars for shingles; 6 dollars for nails; and 5 dollars for screws. How many dollars did he spend?
Ans. 52 *dols.*

10. A merchant bought at one time, 54 barrels of beef; at another 40; at another 15; and at another 41. How many did he buy in all?
Ans. 150.

11. A man borrowed a sum of money, and paid in part 267 dollars, and afterwards paid the remainder 325 dollars. How much did he borrow?
Ans. 592 *dols.*

12. A gentleman gave 32 dollars for a piece of cloth, and 13 dollars for having it made into a suit of clothes. How much did suit cost? *Ans.* 45 *dols.*

FORM

207	
41	
2490	
60	
150	
24	
10	
550	
25	
37	
18	
80	
31	
10	
6	
5	
52	
54	
40	
15	
41	
150	
267	
325	
59	
3	
1	

FORM.

13. A general has three regiments under his command; in the first are 478 men; in the second 564; and in the third 593. How many men are there in the whole?

Ans. 1635.

478
564
593
1635

14. A trader gave 48 dollars for a chest of tea, and 3 dollars for getting it home. For how much must he sell the tea, in order to gain 8 dollars?

Ans. 59 *dols.*

48
3
8
59

15. A man traveled 27 miles in one day; 15 miles the next day, and 8 miles the next. How many miles did he travel in the whole?

Ans. 50 *miles.*

27
15
8
50

16. A man bought a hat for 8 dollars, a coat for 27 dollars, a pair of boots for 5 dollars, and a vest for 7 dollars. To how many dollars did the whole amount?

Ans. 47 *dols.*

8
27
5
7
47

17. A person owes A. 10 dollars; B. 216 dollars; C. 85 dollars; D. 92 dollars. What is the amount of his debts?

Ans. 403 *dols.*

10
216
85
92
403

18. A man bought a suit of clothes for 57 dollars; a pair of boots for 8 dollars; and a secretary for 28 dollars. What did he give for the whole?

Ans. 93 *dols.*

57
8
28
93

MULTIPLICATION

MEANS the repeating or adding of a number to itself several times. This may be learned by the following

MULTIPLICATION TABLE.

1 once 2 are 2	2 times 1 are 2	7 times 1 are 7	1 once 0 is 0
2 times 6 are 12	1 once 5 are 5	1 once 8 are 8	2 times 0 is 0
1 once 3 are 3	5 times 2 are 10	8 times 2 are 16	6 times 2 are 12
2 times 3 are 6	6 times 3 are 18	9 times 4 are 36	7 times 8 are 56
1 once 4 are 4	5 times 5 are 25	8 times 8 are 64	5 times 9 are 45
2 times 2 are 4	6 times 1 are 6	9 times 3 are 27	6 times 7 are 42
4 times 5 are 20	1 once 7 are 7	8 times 1 are 8	7 times 4 are 28
2 times 7 are 14	5 times 6 are 30	9 times 2 are 18	6 times 8 are 48
4 times 4 are 16	7 times 3 are 21	1 once 9 are 9	7 times 6 are 42
2 times 8 are 16	6 times 4 are 24	8 times 7 are 56	3 times 8 are 24
3 times 3 are 9	5 times 8 are 40	9 times 5 are 45	4 times 3 are 12
2 times 9 are 18	7 times 5 are 35	8 times 6 are 48	2 times 5 are 10
3 times 2 are 6	6 times 6 are 36	9 times 1 are 9	3 times 6 are 18
4 times 2 are 8	5 times 4 are 20	8 times 5 are 40	4 times 9 are 36
3 times 5 are 15	7 times 2 are 14	9 times 6 are 54	2 times 4 are 8
4 times 7 are 28	6 times 9 are 54	8 times 3 are 24	3 times 0 is 0
3 times 4 are 12	5 times 1 are 5	9 times 9 are 81	4 times 0 is 0
4 times 8 are 32	7 times 7 are 49	8 times 4 are 32	5 times 0 is 0
3 times 1 are 3	6 times 5 are 30	9 times 7 are 63	6 times 0 is 0
4 times 6 are 24	5 times 3 are 15	8 times 8 are 64	7 times 0 is 0
3 times 7 are 21	1 once 6 are 6	8 times 9 are 72	8 times 0 is 0
4 times 1 are 4	7 times 9 are 63	9 times 8 are 72	9 times 0 is 0
3 times 9 are 27	5 times 7 are 35		

QUESTIONS

To be asked by the teacher and answered by the pupils.

1 once 2 are	3 times 1 are	1 once 4 are
2 times 2 are	3 times 2 are	2 times 4 are
3 times 2 are	3 times 3 are	3 times 4 are
4 times 2 are	3 times 4 are	4 times 4 are
5 times 2 are	3 times 5 are	5 times 4 are
6 times 2 are	3 times 6 are	6 times 4 are
7 times 2 are	3 times 7 are	7 times 4 are
8 times 2 are	3 times 8 are	8 times 4 are
9 times 2 are	3 times 9 are	9 times 4 are
how many?	how many?	how many?

5 times 1 are	1 once 6 are	7 times 1 are
5 times 2 are	2 times 6 are	7 times 2 are
5 times 3 are	3 times 6 are	7 times 3 are
5 times 4 are	4 times 6 are	7 times 4 are
5 times 5 are	5 times 6 are	7 times 5 are
5 times 6 are	6 times 6 are	7 times 6 are
5 times 7 are	7 times 6 are	7 times 7 are
5 times 8 are	8 times 6 are	7 times 8 are
5 times 9 are	9 times 6 are	7 times 9 are
how many?	how many?	how many?

3 times 6	1 once 8	3 times 5	3 times 7
5 times 8	6 times 6	8 times 8	4 times 4
2 times 2	4 times 5	4 times 6	4 times 8
7 times 7	2 times 8	2 times 9	2 times 5
1 once 4	2 times 3	3 times 3	4 times 7
7 times 9	3 times 9	2 times 7	5 times 1
5 times 5	6 times 7	3 times 4	7 times 8
8 times 9	5 times 6	5 times 7	2 times 6
2 times 4	9 times 9	7 times 1	3 times 8
are how many?	are how many?	are how many?	are how many?

Multiplication of Simple Numbers.

1.) Multiply 43 by 2 = 86

2.) Multiply 43 by 3 = 129

3.) Multiply 34 by 2 = 68

4.) Multiply 213 by 3 = 639

5.) Multiply 413 by 2 = 826

6.) Multiply 342 by 2 = 684

.) Multiply 4134 by 2 = 8268

8.) Multiply 613 by 3 = 1839

9.) Multiply 6243 by 2 = 12486

).) Multiply 1243 by 2 =

11.) Multiply 3321 by 3 =

12.) Multiply 6724 by 2 =

.) Multiply 41423 by 3 =

14.) Multiply 42132 by 3 =

.) Multiply 60009 by 2 =

16.) Multiply 600905 by 2 =

.) Multiply 609030 by 2 =

18.) Multiply 300900 by 4 =

) Multiply 3221423 by 3 =

20.) Multiply 3478909 by 2 =

ANSWERS.

2486 11.) 9963 12.) 13448 13.) 124269
126396 15.) 120018 16.) 1201810 17.) 1218060
1203600 19.) 9664269 20.) 6957818

21.) Multiply 3467890 by 2

22.) Multiply 367456 by

23.) Multiply 345000 by 3

24.) Multiply 398070 by

25.) Multiply 69700000 by 4

26.) Multiply 674500 by

27.) Multiply 34570050 by 2

28.) Multiply 857320 by

29.) Multiply 928720314 by 2

30.) Multiply 480759 by

31.) Multiply 32472321 by 2

32.) Multiply 37234 by

33.) Multiply 60067434 by 9

34.) Multiply 645000 by

35.) Multiply 54632047 by 2

36.) Multiply 678543 by

37.) Multiply 47320567 by 3

38.) Multiply 457346 by

39.) Multiply 67346780 by 5

40.) Multiply 450076 by

ANSWERS.

21.) 6935780 22.) 7349134 23.) 1035000 24.) 79614
25.) 278800000 26.) 202350000 27.) 69140100 28.) 257196
29.) 1857440628 30.) 96150686 31.) 64944642 32.) 7446
33.) 540606906 34.) 516000600 35.) 109264094 36.) 54283
37.) 141961701 38.) 182938712 39.) 336733900 40.) 270045

41.) Multiply 34102564 by 7

42.) Multiply 60543270 by 3

43.) Multiply 16740560 by 9

44.) Multiply 69306589 by 3

45.) Multiply 34775000 by 9

46.) Multiply 32017456 by 5

47.) Multiply 67432107 by 7

48.) Multiply 16737779 by 9

49.) Multiply 23542672 by 3

50.) Multiply 42536042 by 6

51.) Multiply 64734453 by 5

52.) Multiply 46473890 by 8

53.) Multiply 75700002 by 8

54.) Multiply 77893400 by 4

55.) Multiply 97467300 by 7

56.) Multiply 56947000 by 5

57.) Multiply 71200040 by 4

58.) Multiply 67089476 by 6

ANSWERS.

238717948	42.) 181629810	43.) 150665040
207901767	45.) 312975000	46.) 160087280
472024749	48.) 150640011	49.) 70628016
255216252	51.) 323672265	52.) 371791120
605600016	54.) 311573600	55.) 682271100
284735000	57.) 284800160	58.) 402536856

The pupil is now prepared to understand the following

EXPLANATIONS AND RULE.

MULTIPLICATION consists in repeating one of two numbers as ma times as there are units in the other.

The larger of the two numbers is called the *Multiplicand;* and placed first in the operation. The other number, the less, is cal the *Multiplier*, and is placed under the multiplicand.

The third number, made by multiplying, is called the *Produc* answer. The multiplicand and multiplier are called *Factors.*

RULE:—Multiply each figure in the multiplicand by the multip setting down the figures of each product, and reserve the tens t added to the product of the next multiplication—setting down whole sum of the last product figure.

QUESTIONS.

What is multiplication? How many numbers are given? Which is p first?

What is each term called? What are both called together?

What is the third number called? How is it made? What is the rule?

Where do we begin to multiply? What is done with the ten's figure?

Why is it added to that product? What is done with the last figures?

What is done when there are ciphers in the multiplicand?

What is done with ciphers on the right hand of the multiplicand?

When ciphers are placed on the right hand of the multiplier, what is don them?

When ciphers end the multiplicand and multiplier, what is done with the

Is a cipher ever multiplied by a figure? What is done with it?

☞ Let the pupils do the following sums *Orally*.

FORM.

1. What will 2 wagons cost at 23 dollars a piece?

```
23
 2
---
46
```

Ans. 46 *dols.*

2. At 18 cents a pound, what cost 8 pounds of raisins?

```
18
 8
---
144
```

Ans. 144 *cts.*

3. What cost 3 head of cattle at 17 dollars a head?

```
17
 3
---
51
```

Ans. 51 *dols.*

4. What will 18 pounds of pork cost at 4 cents a pound?

```
18
 4
---
72
```

Ans. 72 *cts.*

5. What cost 21 barrels of cider at 3 dollars a barrel?

```
21
 3
---
63
```

Ans. 63 *dols.*

6. At 8 dollars a hundred weight, what cost 43 hundred weight of sugar?

```
43
 8
---
344
```

Ans. 344 *dols.*

7. At 9 dollars a barrel, what cost 653 barrels of flour?

```
653
  9
-----
5877
```

Ans. 5877 *dols.*

8. At 6 cents per pound, what cost 32 pounds of beef?

```
32
 6
---
192
```

Ans. 192 *cts.*

FORM.

9. At 7 dollars a barrel, what costs 35 barrels of flour?

35
7
245

Ans. 245 *dols.*

10. A man has 7 lots, each containing 54 acres of ground. How many acres in all?

54
7
378

Ans. 378.

11. A man employed 27 laborers, and gave them 4 dollars a week. How much did they receive?

27
4
108

Ans. 108 *dols.*

12. What is the value of 6 pounds of Hyson tea, at 120 cents per pound?

120
6
720

Ans. 720 *cts.*

13. What will 13 cords of wood come to, at 7 dollars per cord?

13
7
91

Ans. 91 *dols.*

14. At 6 cents a pound, what is the value of a quarter of beef, weighing 214 pounds?

214
6
1284

Ans. 1284 *cts.*

15. How many yards of linen are in 759 pieces, each containing 5 yards?

Ans. 3795 *yds.*

16. Sold 14 tuns of hay, at 7 dollars per tun. What was the price of the whole?

Ans. 98 *dols.*

SUBTRACTION

Is AN operation by which one number is taken from another, to find what remains, which may be known by the following

SUBTRACTION TABLE.

0 from 1 leaves 1	5 from 5 leaves 0	4 from 8 leaves 4	9 from 10 leaves 1
1 from 1 leaves 0	2 from 7 leaves 5	7 from 12 leaves 5	8 from 8 leaves 0
9 from 3 leaves 1	6 from 13 leaves 7	0 from 8 leaves 8	4 from 10 leaves 6
8 from 6 leaves 2	3 from 5 leaves 2	3 from 12 leaves 9	1 from 8 leaves 7
9 from 9 leaves 7	8 from 10 leaves 2	0 from 9 leaves 0	8 from 9 leaves 1
8 from 5 leaves 1	5 from 13 leaves 8	4 from 12 leaves 8	4 from 7 leaves 3
6 from 10 leaves 4	2 from 5 leaves 3	7 from 11 leaves 4	1 from 10 leaves 9
0 from 18 leaves 9	8 from 16 leaves 8	2 from 2 leaves 0	9 from 13 leaves 4
8 from 6 leaves 3	2 from 4 leaves 2	5 from 11 leaves 6	4 from 4 leaves 0
9 from 16 leaves 9	9 from 17 leaves 8	1 from 8 leaves 7	7 from 9 leaves 2
6 from 9 leaves 1	2 from 8 leaves 6	6 from 11 leaves 5	5 from 6 leaves 1
6 from 3 leaves 2	3 from 10 leaves 7	9 from 9 leaves 0	6 from 9 leaves 3
9 from 8 leaves 3	8 from 15 leaves 7	1 from 6 leaves 5	4 from 12 leaves 8
7 from 2 leaves 1	3 from 11 leaves 8	5 from 14 leaves 9	7 from 13 leaves 6
5 from 4 leaves 1	5 from 7 leaves 2	9 from 12 leaves 3	5 from 9 leaves 4
5 from 7 leaves 6	2 from 6 leaves 4	2 from 10 leaves 8	1 from 4 leaves 3
3 from 11 leaves 9	3 from 3 leaves 0	1 from 5 leaves 4	6 from 14 leaves 8
9 from 14 leaves 7	9 from 15 leaves 6	8 from 13 leaves 5	4 from 9 leaves 5
8 from 17 leaves 9	7 from 13 leaves 6	9 from 11 leaves 2	7 from 8 leaves 1
6 from 12 leaves 6	3 from 8 leaves 5	0 from 3 leaves 3	5 from 10 leaves 5
7 from 13 leaves 9	0 from 7 leaves 7	5 from 12 leaves 7	7 from 16 leaves 9
6 from 15 leaves 9	3 from 9 leaves 6	1 from 9 leaves 8	6 from 6 leaves 0
8 from 2 leaves 2	8 from 12 leaves 4	9 from 14 leaves 5	7 from 10 leaves 3
7 from 7 leaves 0	4 from 11 leaves 7	8 from 11 leaves 3	6 from 7 leaves 1
9 from 16 leaves 7	3 from 7 leaves 4	1 from 2 leaves 1	6 from 8 leaves 2
6 from 12 leaves 6	0 from 4 leaves 4	0 from 6 leaves 6	0 from 5 leaves 5

QUESTIONS

To be asked by the teacher and answered by the pupils.

3 from 4	5 from 7	8 from 17	0 from 2
5 from 14	8 from 11	9 from 15	8 from 10
8 from 8	6 from 10	5 from 8	3 from 7
0 from 9	7 from 15	7 from 16	6 from 14
7 from 8	5 from 9	6 from 11	2 from 9
2 from 11	9 from 12	2 from 8	7 from 13
9 from 18	6 from 13	0 from 4	9 from 17
4 from 13	7 from 11	8 from 13	4 from 6
2 from 3	0 from 6	6 from 9	7 from 14
9 from 11	4 from 12	1 from 10	3 from 11
4 from 8	3 from 6	9 from 13	4 from 12
3 from 12	5 from 13	2 from 6	2 from 5
4 from 9	8 from 16	5 from 10	4 from 11
3 from 10	3 from 8	8 from 14	9 from 16
5 from 12	6 from 15	7 from 12	3 from 9
7 from 9	9 from 14	1 from 3	6 from 12
3 from 3	3 from 5	4 from 4	4 from 5
4 from 7	4 from 10	2 from 2	2 from 3
2 from 4	2 from 8	2 from 10	5 from 5
5 from 6	5 from 11	6 from 6	6 from 7
6 from 8	7 from 10	7 from 7	8 from 9
8 from 12	9 from 9	9 from 10	1 from 2
1 from 4	1 from 5	1 from 6	1 from 7

Leave how many?

Subtraction of Simple Numbers.

1.) From 8 Subtract 4 4	2.) From 24 Subtract 12 12	3.) From 64 Subtract 34 30
4.) From 984 Take 652 332	5.) From 678 Take 424 254	6.) From 568 Take 246 322
7.) From 542 Take 241 301	8.) From 684 Take 462 222	9.) From 486 Take 346 120
10.) From 476 Take 142 334	11.) From 892 Take 431 461	12.) From 869 Take 547 322
13.) From 789 Take 189	14.) From 199 Take 198	15.) From 189 Take 129
16.) From 178 Take 131	17.) From 4862 Take 2622	18.) From 3589 Take 2345
9.) From 5965 Take 3542	20.) From 6898 Take 5452	21.) From 2468 Take 1325
2.) From 7579 Take 4137	23.) From 1647 Take 1112	24.) From 4989 Take 3989

ANSWERS.

13.) 600	14.) 1	15.) 60	16.) 47
17.) 2240	18.) 1244	19.) 2423	20.) 1446
21.) 1143	22.) 3442	23.) 535	24.) 1000

25.)	From	8766	26.)	From	2090	27.)	From	1900
	Take	4320		Take	1020		Take	700
28.)	From	4800	29.)	From	4800	30.)	From	8040
	Take	2100		Take	2100		Take	2030
31.)	From	5846	32.)	From	3416	33.)	From	6948
	Take	2700		Take	1200		Take	2800
34.)	From	70500	35.)	From	43700	36.)	From	67000
	Take	24311		Take	13435		Take	24422
37.)	From	78600	38.)	From	90000	39.)	From	97350
	Take	37421		Take	37159		Take	36140
40.)	From	60000	41.)	From	10000	42.)	From	10000
	Take	18437		Take	1235		Take	9191
43.)	From	10000	44.)	From	40000	45.)	From	60000
	Take	3571		Take	13121		Take	53129
46.)	From	80720	47.)	From	69000	48.)	From	90000
	Take	18717		Take	14159		Take	54321
49.)	From	60800	50.)	From	839000	51.)	From	900000
	Take	52112		Take	327123		Take	897645

ANSWERS.

25.) 4446	26.) 1070	27.) 1200	28.) 2700	29.) 2700
30.) 6010	31.) 3146	32.) 2216	33.) 4148	34.) 46189
35.) 30265	36.) 42578	37.) 41179	38.) 52841	39.) 61204
40.) 41563	41.) 8765	42.) 809	43.) 6429	44.) 26879
45.) 6871	46.) 62003	47.) 54841	48.) 35679	49.) 9688
50.) 511877	51.) 2355			

52.) From	43213	53.) From	86213	54.) From	7324
Take	21324	Take	24324	Take	1437
55.) From	64132	56.) From	74123	57.) From	8621
Take	32243	Take	41654	Take	3753
58.) From	97321	59.) From	87424	60.) From	7242
Take	31463	Take	32657	Take	1363
61.) From	34213	62.) From	47324	63.) From	7432
Take	21367	Take	31678	Take	3146
64.) From	56423	65.) From	73421	66.) From	7342
Take	31567	Take	41563	Take	5165
67.) From	84325	68.) From	97324	69.) From	3421
Take	42869	Take	43676	Take	1762
70.) From	73125	71.) From	87423	72.) From	6341
Take	41376	Take	54764	Take	5167
73.) From	67543	74.) From	37413	75.) From	4683
Take	32687	Take	11564	Take	3294
76.) From	34213	77.) From	87213	78.) From	4721
Take	12756	Take	43534	Take	2543

ANSWERS.

52.) 21889	53.) 61889	54.) 5887	55.) 31889	56.) 32469
57.) 4868	58.) 65858	59.) 54767	60.) 5879	61.) 12846
62.) 15646	63.) 4286	64.) 24856	65.) 31858	66.) 2177
67.) 41456	68.) 53648	69.) 1659	70.) 31749	71.) 32659
72.) 1174	73.) 34856	74.) 25849	75.) 1389	76.) 21457
77.) 436	78.) 2178			

79.)	From	6040203050	80.	From	78546800009
	Take	987654321		Take	63200098799
81.)	From	6007008009	82.)	From	68002005001
	Take	1900800700		Take	23123456789
83.)	From	1203400506	84.)	From	10004070400
	Take	309809787		Take	9005080321
85.)	From	3000045000	86.)	From	10004000000
	Take	1930014003		Take	1941320419
87.)	From	1000400000	88.)	From	83045004500
	Take	194567134		Take	41156005946
89.)	From	6400400034	90.)	From	14782004573
	Take	2107500005		Take	14775204167
91.)	From	3000000000	92.)	From	78400506807
	Take	1219732001		Take	20809787306
93.)	From	4673473000	94.)	From	50004703024
	Take	3467341927		Take	21900004015
95.)	From	1400040780	96.)	From	70300000000
	Take	1212345678		Take	43310030900

ANSWERS.

79.) 5052548729	80.) 15346701210	81.) 4106207309
82.) 44878548212	83.) 893590719	84.) 998990079
85.) 1070030997	86.) 8062679581	87.) 805832866
88.) 41888998554	89.) 4292900029	90.) 8800406
91.) 1780267999	92.) 57590719501	93.) 1206131073
94.) 28104699009	95.) 187695102	96.) 26989969100

The pupil is now prepared to understand the following

EXPLANATIONS AND RULE.

SUBTRACTION is taking a less number from a greater. The greater number is placed first in the operation, and is called the *minuend.* The less number is placed below the greater, and is called the *subtrahend.* The third number, which is the answer, is called the *difference.*

RULE :—Begin at the right hand figure of the less number, take it from the figure of the larger number, place the difference under the same.

When one or more ciphers are in the larger number, call each of them 10, and add 1 to the next left hand figure of the lower line; then take it from the upper figure. If any figure in the larger number should be less than the figure below it, add 10 to it; and then take the under figure therefrom: then add 1 to the next figure in the lower line.

QUESTIONS.

What is subtraction? What number is placed first in the operation?
What is it called? Why so called? Because it is to be lessened.
What is the less number called, and where placed? Why so called? Because it means to take from. What is the number found called?
What is done when there are ciphers in the upper line? How many is added to the next figure in the lower line?
What is done when a figure in the larger number, is less than the one below it? How many is added to the next figure in the lower line?
If a cipher be taken from a figure, what will remain? Give an example.
If one or more figures at the end of a sum be alike, what is set down? What if it be not at the end?
What is done with figures in the upper number, having no figures under them?

☞ Let the pupils do the following sums *Orally*.

1. A man raised 164 bushels of corn, and sold 115 bushels. How many bushels had he left?
Ans. 49.

FORM.
164
115
49

2. If you sell 45 yards from a piece of cloth containing 163 yards. How many yards will remain?
Ans. 118.

163
45
118

3. A merchant bought 150 barrels of flour, and sold 47 of them. How many had he left?
Ans. 103 *bar.*

150
47
103

4. A merchant bought a box of goods for 107 dollars, and sold it for 214 dollars. How much did he gain?
Ans. 107 *dols.*

214
107
107

5. A merchant bought 875 bushels of wheat, out of which he sold 276 bushels. How many bushels has he left?
Ans. 599.

875
276
599

6. A man received 312 dollars for work, and paid 72 dollars for his board. How many dollars did he save?
Ans. 240 *dols.*

312
72
240

7. Bought 200 barrels of flour, and sold 81. How many barrels have I left?
Ans. 119.

200
81
119

8. A man bought a farm for 6564 dollars, and sold it again for 7880 dollars. How much did he gain by the bargain?
Ans. 1316 *dols.*

7880
6564
1316

9. A man had 140 sheep, and sold 75 of them. How many had he left?
Ans. 65.

FORM.
140
75
65

10. A butcher, who had 436 dollars on hand, paid out 62 dollars for sheep. How many dollars had he left?
Ans. 374.

436
62
374

11. A man who owed a debt of 112 dollars, paid 15 dollars of it. How many dollars remained unpaid?
Ans. 97.

112
15
97

12. A farmer who had 134 sheep, sold 80 of his flock. How many had he remaining?
Ans. 54.

134
80
54

13. A merchant paid 13,745 dollars for a ship, and sold it for 15,150 dollars. What did he gain?
Ans. 1,405 *dols.*

15150
13745
1405

14. A merchant had 531 yards of cloth, and sold 416 yards. How many had he left?
Ans. 115.

531
416
115

15. A purchase of goods that cost 685 dollars, was sold for 973 dollars. What was the profit?
Ans. 288 *dols.*

973
685
288

16. A trader having 1748 dollars, laid out 616 dollars for goods. How many dollars had he remaining?
Ans 1132 *dols.*

1748
616
1132

DIVISION

Is SEPARATING a number into several parts, or is finding how often one number is contained in another.

Numbers that divide without remainder.

Tell how many times		Tell how many times		Tell how many times	
5 in 25	*Ans.* 5	4 in 32	*Ans.* 8	9 in 18	*Ans.* 2
4 in 20	5	3 in 3	1	6 in 30	5
6 in 36	6	5 in 10	2	5 in 45	9
7 in 42	6	9 in 54	6	9 in 72	8
8 in 56	7	7 in 63	9	2 in 16	8
8 in 24	3	2 in 2	1	9 in 63	7
3 in 27	9	5 in 20	4	1 in 9	9
Tell how many times		Tell how many times		Tell how many times	
2 in 16	*Ans.* 8	2 in 10	*Ans.* 5	3 in 24	*Ans.* 8
3 in 12	4	3 in 18	6	4 in 24	6
4 in 20	5	4 in 8	2	8 in 48	6
5 in 40	8	8 in 16	2	6 in 12	2
4 in 16	4	2 in 6	3	8 in 24	3
4 in 12	3	3 in 3	1	3 in 6	2
6 in 24	4	5 in 30	6	9 in 36	4
Tell how many times		Tell how many times		Tell how many times	
7 in 63	*Ans.* 9	7 in 42	*Ans.* 6	6 in 36	*Ans.* 6
5 in 30	6	9 in 72	8	4 in 28	7
8 in 48	6	3 in 18	6	8 in 40	5
6 in 48	8	9 in 54	6	7 in 63	9
8 in 72	9	5 in 10	2	8 in 64	8
5 in 10	2	9 in 45	5	9 in 36	4
6 in 30	5	8 in 32	4	6 in 42	7

Numbers that divide with remainder.

2 in	3 1 1 over	5 in	6 1 1 over	6 in	28 4 4 over	8 in	25 3 1 over
2 in	5 2 1 over	5 in	7 1 2 over	6 in	29 4 5 over	8 in	26 3 2 over
2 in	7 3 1 over	5 in	8 1 3 over	7 in	8 1 1 over	8 in	27 3 3 over
2 in	9 4 1 over	5 in	9 1 4 over	7 in	9 1 2 over	8 in	28 3 4 over
2 in	11 5 1 over	5 in	11 2 1 over	7 in	10 1 3 over	8 in	29 3 5 over
2 in	13 6 1 over	5 in	12 2 2 over	7 in	11 1 4 over	9 in	10 1 1 over
2 in	15 7 1 over	5 in	13 2 3 over	7 in	12 1 5 over	9 in	11 1 2 over
2 in	17 8 1 over	5 in	14 2 4 over	7 in	13 1 6 over	9 in	12 1 3 over
2 in	19 9 1 over	5 in	16 3 1 over	7 in	15 2 1 over	9 in	13 1 4 over
3 in	4 1 1 over	5 in	17 3 2 over	7 in	16 2 2 over	9 in	14 1 5 over
3 in	5 1 2 over	5 in	18 3 3 over	7 in	17 2 3 over	9 in	15 1 6 over
3 in	7 2 1 over	5 in	19 3 4 over	7 in	18 2 4 over	9 in	16 1 7 over
3 in	8 2 2 over	6 in	7 1 1 over	7 in	19 2 5 over	9 in	17 1 8 over
3 in	10 3 1 over	6 in	8 1 2 over	7 in	20 2 6 over	9 in	19 2 1 over
3 in	11 3 2 over	6 in	9 1 3 over	7 in	22 3 1 over	9 in	20 2 2 over
3 in	13 4 1 over	6 in	10 1 4 over	8 in	9 1 1 over	9 in	21 2 3 over
3 in	16 5 1 over	6 in	11 1 5 over	8 in	10 1 2 over	9 in	22 2 4 over
3 in	17 5 2 over	6 in	13 2 1 over	8 in	11 1 3 over	9 in	23 2 5 over
3 in	19 6 1 over	6 in	14 2 2 over	8 in	12 1 4 over	9 in	24 2 6 over
4 in	5 1 1 over	6 in	15 2 3 over	8 in	13 1 5 over	9 in	25 2 7 over
4 in	6 1 2 over	6 in	16 2 4 over	8 in	14 1 6 over	9 in	26 2 8 over
4 in	7 1 3 over	6 in	17 2 5 over	8 in	15 1 7 over	9 in	28 3 1 over
4 in	9 2 1 over	6 in	19 3 1 over	8 in	17 2 1 over	9 in	29 3 2 over
4 in	10 2 2 over	6 in	20 3 2 over	8 in	18 2 2 over	9 in	30 3 3 over
4 in	11 2 3 over	6 in	21 3 3 over	8 in	19 2 3 over	9 in	31 3 4 over
4 in	13 3 1 over	6 in	22 3 4 over	8 in	20 2 4 over	9 in	32 3 5 over
4 in	14 3 2 over	6 in	23 3 5 over	8 in	21 2 5 over	9 in	33 3 6 over
4 in	15 3 3 over	6 in	25 4 1 over	8 in	22 2 6 over	9 in	34 3 7 over
4 in	17 4 1 over	6 in	26 4 2 over	8 in	23 2 7 over	9 in	35 3 8 over

1.) Divide 4 8 6 2 4 8 by 2.
2)
2 4 3 1 2 4

2.) Divide 8 6 4 2 6 8 by 2.
2)
4 3 2 1 3 4

3.) Divide 8 4 2 6 8 4 by 2.
2)
4 2 1 3 4 2

4.) Divide 2 6 8 4 6 2 by 2.
2)
1 3 4 2 3 1

5.) Divide 2 4 8 4 8 6 by 2.
2)
1 2 4 2 4 3

6.) Divide 6 8 4 2 8 4 by 2.
2)
3 4 2 1 4 2

7.) Divide 6 8 4 2 4 8 by 2.
2)
3 4 2 1 2 4

8.) Divide 4 8 6 4 2 8 by 2.
2)
2 4 3 2 1 4

9.) Divide 2 6 8 4 8 2 by 2.
2)
1 3 4 2 4 1

10.) Divide 2 8 6 4 2 8 by 2.
2)
1 4 3 2 1 4

11.) Divide 6 9 3 6 9 3 by 3.
3)
2 3 1 2 3 1

12.) Divide 3 9 6 3 9 6 by 3.
3)
1 3 2 1 3 2

13.) Divide 9 3 6 3 9 6 by 3.
3)
3 1 2 1 3 2

14.) Divide 6 3 9 6 9 6 by 3.
3)
2 1 3 2 3 2

15.) Divide 3 9 6 9 3 6 by 3.
3)
1 3 2 3 1 2

16.) Divide 6 3 9 6 3 9 by 3.
3)
2 1 3 2 1 3

17.) Divide 4 8 4 8 4 8 by 4.

4)4 8 4 8 4 8

1 2 1 2 1 2

18.) Divide 8 4 8 4 8 4 by 4.

4)8 4 8 4 8 4

2 1 2 1 2 1

19.) Divide 8 6 0 4 0 2 by 2.

2)8 6 0 4 0 2

4 3 0 2 0 1

20.) Divide 3 0 6 0 9 3 by 3.

3)3 0 6 0 9 3

1 0 2 0 3 1

21.) Divide 6 0 3 0 9 3 by 3.

3)6 0 3 0 9 3

2 0 1 0 3 1

22.) Divide 4 0 8 2 0 4 by 2.

2)4 0 8 2 0 4

2 0 4 1 0 2

23.) Divide 4 0 8 0 4 8 by 4.

4)4 0 8 0 4 8

1 0 2 0 1 2

24.) Divide 8 0 4 6 0 4 by 2.

2)8 0 4 6 0 4

4 0 2 3 0 2

25.) Divide 6 0 3 0 6 3 by 3.

3)6 0 3 0 6 3

2 0 1 0 2 1

26.) Divide 8 0 4 0 4 8 by 4.

4)8 0 4 0 4 8

2 0 1 0 1 2

27.) Divide 12 14 16 18 by 2.

2)12 14 16 18

6 07 08 09

28.) Divide 12 15 18 21 by 3.

3)12 15 18 21

4 05 06 07

29.) Divide 12 16 20 24 by 4.

4)12 16 20 24

3 04 05 06

30.) Divide 10 15 20 25 by 5.

5)10 15 20 25

2 03 04 05

31.) Divide 12 18 24 30 by 6.

6)12 18 24 30

2 03 04 05

32.) Divide 14 21 28 35 by 7.

7)14 21 28 35

2 03 04 05

33.) Divide 45 27 18 36 by 9.

9)45 27 18 36

5 03 02 04

34.) Divide 32 40 24 16 by 8.

8)32 40 24 16

4 05 03 02

35.) Divide 18 14 12 10 by 2.

2)18 14 12 10

9 07 06 05

36.) Divide 54 18 42 36 by 6.

6)54 18 42 36

9 03 07 06

37.) Divide 27 12 24 15 by 3.

3)27 12 24 15

9 04 08 05

38.) Divide 45 15 35 20 by 5.

5)45 15 35 20

9 03 07 04

39.) Divide 21 63 35 56 by 7.

7)21 63 35 56

3 09 05 08

40.) Divide 28 36 16 24 by 4.

4)28 36 16 24

7 09 04 06

41.) Divide 12 24 21 18 by 3.

3)12 24 21 18

4 08 07 06

42.) Divide 48 72 56 64 by 8.

8)48 72 56 64

6 09 07 08

43.) Divide 20 30 40 25 by 5.

5)20 30 40 25

4 06 08 05

44.) Divide 16 12 18 14 by 2.

2)16 12 18 14

8 06 09 07

45.) Divide 30 48 42 24 by 6.

6)30 48 42 24

5 08 07 04

46.) Divide 20 12 32 36 by 4.

4)20 12 32 36

5 03 08 09

47.) Divide 28 49 42 63 by 7.

7)28 49 42 63

4 07 06 09

48.) Divide 54 63 72 81 by 9.

9)54 63 72 81

6 07 08 09

49.) Divide 5·3·7·5·3·2 by 2.
2)
268766

50.) Divide 7·3·6·9·6·2 by 3.
3)
245654

51.) Divide 9·3·7·3·7·2 by 4.
4)
234343

52.) Divide 6·1·6·1·6·0 by 5.
5)
123232

53.) Divide 7·3·9·3·9·2 by 6.
6)
123232

54.) Divide 5·3·7·5·3·2 by 2.
2)
268766

55.) Divide 8·5·6·2·5·4 by 7.
7)
122322

56.) Divide 9·8·5·7·8·4 by 8.
8)
123223

57.) Divide 9·4·9·8·3·6 by 4.
4)
237459

58.) Divide 8·5·3·6·4·4 by 3.
3)
284548

59.) Divide 6·1·6·3·6·5 by 5.
5)
123273

60.) Divide 7·3·9·0·5·6 by 6.
6)
123176

61.) Divide 9·4·1·3·7·2 by 4.
4)
235343

62.) Divide 8·5·7·0·2·4 by 7.
7)
122432

63.) Divide 7·1·2·4·5·2 by 3.
3)
237484

64.) Divide 9·8·5·7·0·4 by 8.
8)
123213

The pupil is now prepared to understand the following

EXPLANATIONS AND RULES.

Division is finding how often one number is contained in another, and thus finding what part of one number is another number.

The number to be divided is called the *Dividend.*

The number by which we divide is called the *Divisor.*

The answer is called the *Quotient.*

What is left over, after division, is called the *Remainder.*

Rule:—Seek how often the first or first two figures, contain the divisor, then put the number of times underneath for the quotient. If any remains, conceive it joined to the next right hand figure, and divide as before. If a figure in the dividend be less than the divisor, place a cipher under it; then join it to the next figure and divide as before.

QUESTIONS.

What is division? The number divided is called what?
The number that divides what? What is the answer called?
What is called the remainder? How is a sum in division began?
What is the next step? What is done with the product?
What if there be a remainder? What is done with them?
What if there be a figure in the dividend less than the divisor?
What is the next step? What if there be a cipher in the dividend?
What if the first figure of the dividend be less than the divisor?

☞ Let the pupil do the following sums *orally*.

FORM.

1. A man had 812 acres of land, which he wished to fence off into 4 equal lots. How many acres might he have in each lot?
Ans. 203. 4)812 / 203

2. If 4 yards of cloth will make a suit of clothes. How many suits will 536 yards make?
Ans. 134. 4)536 / 134

3. A man paid 802 dollars for land, at 2 dollars an acre. How many acres did he buy?
Ans. 401. 2)802 / 401

4. A farmer sells a drove of sheep for 2 dollars a head, and receives 250 dollars. How many sheep did he sell?
Ans. 125. 2)250 / 125

5. Bought flour to the amount of 884 dollars, 4 dollars a barrel. How many barrels did I buy?
Ans. 221. 4)884 / 221

6. A section of land containing 885 acres, was divided into 3 farms. How many acres did each farm contain?
Ans. 295. 3)885 / 295

7. A man left his farm, containing 580 acres, to be divided equally among his four sons. How many acres had each?
Ans. 145. 4)580 / 145

8. If one man can build a house in 365 days. How long will 5 men be in doing it?
Ans. 73 *days*. 5)365 / 73

9. A person dying, leaves an estate of 4500 dollars to be divided equally among 5 children. What is each one's share?
Ans. 900 *dols*. 5)4500 / 900

SUMMARY REVIEW.

ADDITION is the putting of two or more numbers together, and naming the amount in one *sum*.

☞ Let the pupils answer the following questions.

If 2 weeks be added to 7 weeks: how many *weeks* will there be?
If 6 pounds be added to 5 pounds: how many *pounds* will there be?
If 3 bushels be added to 4 bushels: how many *bushels* will there be?
If 7 yards be added to 8 yards: how many *yards* will there be?

SUBTRACTION is taking a less number from a greater, to show the remainder or difference.

☞ Let the pupils answer the following questions.

If 4 bushels are taken from 8 bushels: *what* will remain?
If you take 3 dollars from 6 dollars: *what* will remain?
If 4 yards be taken from 6 yards: *what* will remain?
If you take 4 dollars from 7 dollars: *what* will remain?
A man has 12 bushels of grain, and sells 7 bushels: how many will remain?

MULTIPLICATION is repeating a number, as often as there are units in another number.

☞ Let the pupils answer the following questions.

If you repeat 7 5 times: *what* is the amount?
If you repeat 4 dollars 5 times: *what* is the amount?
If you repeat 8 3 times: *what* is the amount?
If 3 yards be repeated 3 times: *what* is the product?
If you repeat 5 dollars 6 times: *what* is the amount?
If 5 feet be repeated 4 times: *what* is the product?

DIVISION is finding how often one number is contained in another.

☞ Let the pupils answer the following questions.

How many times is 3 contained in 6?
How many times 5 are there in 45?
How many 9 cents are there in 63 cents?
How many 4 bushels are there in 20 bushels?
How many 6 acres are there in 48 acres?
How many 8 pounds are there in 64 pounds?
How many 5 yards are there in 40 yards?

DIVISION is separating a number into equal parts, and thus finding how often one number is contained in another.

☞ Let the pupils answer the following questions.

If you divide 6 into 2 equal parts: how many will there be in each part?
24 into 4 equal parts: how many will there be in each part?
36 into 6 equal parts: how many will there be in each part?
Divide 10 yards of cloth into 2 equal parts: how much in each part?
25 acres of land into 5 equal lots how much in each lot?
30 bushels of corn among 6 men: how much will each receive?
40 dollars among 8 persons: how much will each have?
36 cords of wood among 6 men: how much will each receive?

DIVISION is finding how many times one number may be taken or subtracted from another.

☞ Let the pupils answer the following questions.

How many times can 3 be taken from 6?
How many times can 6 be taken from 18?
How many times can 5 dollars be taken from 10 dollars?
How many times can 9 yards be taken from 18 yards?
How many times can 7 bushels be taken from 21 bushels?

USES OF MULTIPLICATION.

1. To FIND the total value of an article or commodity, when the price per pound, bushel, yard, &c., is given.

Ex. If a yard of cloth is worth *a* dollar: what is the value of 6 yards? ANS. 6 *dols.*

☞ Let the pupil state the sum in this manner.

If one yard be worth *a* dollar—then 6 yards *must* be worth as many dollars as there are number of yards, viz.: 6 *dollars.*

OBS. Let the following sums be stated in the same way.

1. How much will 10 yards of cloth cost, at *a* dollar a yard?
ANS. 10 *dols.*

2. If a man spend *a* dollar in one day: how much will he spend in 7 days? ANS. 7 *dols.*

3. If a bushel of rye be worth *a* dollar: how much would 10 bushels cost? ANS. 10 *dols.*

4. What are a man's expenses for a year, who expends *a* dollar a day? ANS. 365 *dols.*

Again—What will 5 barrels of flour cost, at 2 dollars *a* barrel?

SOLUTION—2 times 5 are 10, the answer, 10 *dollars.*

☞ Let the pupil *state* the sum in this manner.

If one barrel cost 2 dollars, 5 barrels will cost 5 times 2 dollars, that is, 5 times as much, viz.: 10 dollars.

Hence, the

RULE:—Multiply the quantity by the price—that is, repeat the price as many times as there are units in the quantity.

OBS. Let the following sums be *stated* as above.

1. What will 8 yards of cloth cost, at 4 dollars *a* yard?
ANS. 32 *dols.*

2. What will 9 casks of rice cost, at 9 dollars *a* cask?
ANS. 81 *dols.*

3. What will 7 reams of paper cost, at 5 dollars *a* ream?
ANS. 35 *dols.*

Obs. When there are several figures in the multiplicand, multiply each figure seperately—and then name the amount after the operation is finished.

Ex. What cost 147 barrels of flour, at 7 dollars a barrel?

Solution.—7 times 7 are 49; 7 times 4 are 28, 4 are 32; 7 times 1 are 7, 3 are 10.—Total, 1029 *dollars.*

☞ Let the following sums be solved as above.

1. What cost 124 yards of silk, at 3 dollars *a* yard?
Ans. 372 *dols.*
2. What cost 45 yards of superfine broadcloth, at 9 dollars *a* yard?
Ans. 405 *dols.*
3. A butcher bought 45 sheep at 3 dollars *a* head: what did they come to?
Ans. 135 *dols.*
4. What is the value of 87 barrels of flour, at 6 dollars *a* barrel?
Ans. 522 *dols.*

Again—If a horse travel 6 miles in an hour: how far will he travel in 2 hours?
Ans. 12 *miles.*

☞ Let the pupil *state* the sum in this manner.

In one hour he will travel 6 miles; in 2 two hours he will travel *twice* as far, viz.: 12 miles.

Hence, to multiply one quantity by another, &c.

Rule:—Multiply the number expressing unity by the number of times it is to be repeated.

Obs. Let the following sums be *stated* as above.

1. If one horse eat 3 bushels of oats *a* day: how many bushels will 4 horses eat?
Ans. 12 *bush.*
2. If one man spend 12 dollars *a* week: how many dollars will 3 men spend?
Ans. 36 *dols.*
3. If a man's income be 2 dollars *a* day: what will it be in 6 days?
Ans. 12 *dols.*

Again—If a man spend 3 dollars *a* week: how much does he spend a month? ANS. 12 *dols.*

☞ Let the pupil *state* the sum in this manner.

As there are 4 weeks in a month, a man will spend 4 times as much in a month, as in a week: 4 times 3 are 12. He will spend 12 dollars.

OBS. Let the following sums be *stated* in the same way.

1. If a man travel 8 miles *a* day: how far will he travel in a week? ANS. 56 *miles.*

2. If a man earn 6 dollars *a* week: how much will he earn in one year? ANS. 312 *dols.*

3. If a man spend 5 dollars *a* month: how much will he spend in a year? ANS. 60 *dols.*

2. To find unity—which is, any single thing of any kind.

Ex. If 6 men can do a piece of work in 3 days: how long will it take *one* man to do it?

SOLUTION.—3 times 6 are 18, the answer, 18 *days.*

☞ Let the pupil *state* the sum in this manner.

If it take 6 men 3 days to do the work; it will take 1 man 6 times 3 days, that is, 18 days—for fewer the men, longer the time.

Hence, to find unity, when less requires more.

RULE.—Multiply the numbers that make the supposition together, the product will be the answer.

OBS. Let the following sums be *stated* as above.

1. If three men can mow a field in 2 days: how many days would 1 man be doing it? ANS. 6 *days.*

2. If a barrel of cider will last 10 men 4 weeks: how many weeks will it last 1 man? ANS. 40 *weeks.*

3. If 8 men can do a piece of work in 5 days: how many men can do it in 1 day? ANS. 40 *men.*

USE OF DIVISION.

1. To FIND the price of a single pound, yard, bushel, &c., having the amount given.

Ex. If three yards of cloth cost 12 dollars: what is that *a* yard?

SOLUTION.—3 in 12, 4 times, the Ans. 4 *dols.*

☞ Let the pupil *state* the sum in this manner.

If 3 yards be worth 12 dollars—1 yard must be worth only the third part of 12 dollars, viz.: 4 dollars, which is found by dividing 12 by 3.

Hence, to find the price of a single yard, &c.

RULE:—Divide the price of the whole by the quantity.

OBS. Let the following sums be *stated* as above.

1. If a piece of cloth, containing 4 yards, cost 16 dollars: what cost *one* yard? ANS. 4 *dols.*
2. If 9 bushels of wheat cost 18 dollars: what will *one* bushel cost? ANS. 2 *dols.*
3. Bought 9 barrels of flour for 45 dollars: what was that *a* barrel? ANS. 5 *dols.*
4. Sold 4 cords of wood for 16 dollars: what was that *a* cord? ANS. 4 *dols.*

2. To find what amount can be bought for a certain sum, at a given price per article, yard, pound, &c.

Ex. How many barrels of flour, at 5 dollars a barrel, may be bought for 20 dollars.

SOLUTION.—5 in 20, 4 times, the Ans. 4 *barrels.*

☞ Let the pupil *state* the sum in this manner.

As many barrels may be bought, as there are 5 dollars in 20 dollars—for every 5 dollars there will be 1 barrel: and 5 is contained in 20, 4 times, which 4 is *barrels.*

☞ Let the following sums be *stated* in the same way.

1. At 6 cents a pound: how many pounds of meat may be bought for 54 cents? Ans 6 *lbs.*

2. At 4 dollars a box: how many boxes of oranges can be bought for 12 dollars? ANS. 3.

3. How many plows at 8 dollars each, may be bought for 24 dollars? ANS. 3 *plows.*

4. At 5 dollars a yard: how many yards of cloth can be bought for 50 dollars? ANS. 10 *yards.*

OBS. Examples like the following are solved as the preceding; but the purpose is different, viz.: to see how many times one number may be taken from another.

1. A man having 54 dollars, laid it all out for cloth, at 6 dollars a yard. How many yards did he buy? ANS 9.

2. How many coats, of 3 yards each, could be made from a piece of cloth containing 24 yards? ANS. 8 *coats.*

3. How many weeks board can be had for 27 dollars, at 3 dollars per week? ANS. 9 *weeks.*

4. A man bought sheep, at 2 dollars per head, to the amount of 20 dollars: how many sheep did he buy? ANS. 10.

Division is applied to another purpose, viz.: to divide a number into equal parts.

1. A man divided some corn among 6 persons, giving them a bushel a piece. How many bushels did it take? ANS. 6.

2. If 54 dollars be divided equally among 6 men: what will each man receive? ANS. 9 *dols.*

3. 8 men receive 40 dollars for performing a piece of work: what was each one's share? ANS. 5 *dols.*

4. A man having 18 bushels of grain, divided it equally among 3 men: how much did he give them a piece? ANS. 6 *bush.*

5. Divide 56 bushels of corn equally among 8 men: how much will they have a piece? ANS. 7 *bush.*

Obs. There are two methods of finding unity—one by *Multiplication*, as shown at page 66, Art. 2d. The other by DIVISION, as follows:

Ex. If 5 men spend 20 dollars a week: how much will 1 man spend?

SOLUTION.—5 is contained in 20, 4 times.—Ans. 4 *dollars*.

☞ Let the pupil *state* the sum in this manner.

If 5 men spend 20 dollars—1 will spend only the 5th part as much. The 5th part of 20 dollars, is 4 dollars.

Hence, to find unity when *less requires less*.

RULE:—Divide the larger number of the supposition by the smaller—the quotient will be the answer.

Obs. Let the following sums be solved and *explained* as above.

1. If it take 12 yards of cloth to make 6 coats: how much does it take to make 1 coat? ANS. 2 *yds*.
2. If a man travel at the rate of 180 miles in 6 days: how far will he travel in 1 day? ANS. 30 *miles*.
3. If 8 sheep yield 16 pounds of wool: how many pounds will be obtained from 1 sheep? ANS. 2.
4. A laborer engaged to work 8 months for 80 dollars: how much did he receive per month? ANS. 10 *dols*.
5. If 6 bushels of oats will keep 2 horses a week: how many bushels will be required to keep one horse the same time? ANS. 3 *bush*.
6. If 8 tuns of hay will keep 4 horses three months: how much will keep 1 horse the same time? ANS. 2 *tuns*.
7. If a man earn 40 dollars in 5 months: how long must he work to earn 64 dollars? ANS. 8 *mo*.

REM. Division is applied to *four* distinct purposes, though the operation is the same in *all*. The first, is to find the price of *one* pound, &c.—Second, to find what amount can be bought for a given sum, knowing the price of unity.—Third, to divide a number into equal parts.—Fourth, to find unity, when less requires less.

QUESTIONS ON THE FOREGOING.

When the price of one yard, one pound, or the price of a unit of any kind, is given: how do you obtain the price of a quantity? *Ans.* By multiplying the price of one, by the number expressing the quantity.

Why should that give the price of the quantity? *Ans.* Because it is repeating the price of one, as many times, as the quantity expresses, or contains units.

If one yard cost 4 dollars: how would you find the price of 4 yards? *Ans.* I would multiply 4 dollars, the price of one yard, by the units expressed in the number of yards, that is, by 4.

Why should that give the price of 4 yards? *Ans.* Because it is plain, that 4 yards must cost 4 times as much, as *one* yard; and by multiplying the price of 4 yards by 4, is repeating the price of one yard, 4 times?

When you have the price of a quantity given, how do you obtain the price of one? *Ans.* By dividing the price of the quantity, by the number that expresses the quantity, and the quotient will be the price of one.

Suppose the price of 12 yards to be 48 dollars: how would you find the price of one yard? *Ans.* By dividing 48 dollars, the price of the quantity, by 12, the number expressing the quantity; and the quotient will be the price of one yard.

Why should that give the price of one yard? *Ans.* Because *one* yard must be worth a 12th part as much as twelve yards, and by dividing the price of 12 yards by 12, our quotient is a 12th part of our dividend.

CONNECTED OPERATIONS—MULTIPLICATION AND DIVISION.

EXAMPLES.

1. If 4 yards of broadcloth cost 12 dollars: what cost 9 yards?
ANS. 27 *dols.*

SOLUTION.—4 in 12, *three* times:—three times 9 are 27, the Ans. 27 *dollars.*

☞ Let the pupil *state* the sum in this manner.

If 4 yards cost 12 dollars, *one* yard must cost a *fourth* of 12 dollars.—Therefore, *divide* 12 dollars by 4, and we have the cost of *one* yard. *Multiply* this (3 dollars) by 9, and we have the cost of 9 yards.

2. If 2 yards of cloth cost 4 dollars: what would 7 yards cost?
ANS. 14 *dols.*

☞ Let the pupil *state* the sum in this manner.

If 2 yards cost 4 dollars, *one* yard would cost *one half* of 4 dollars, viz. 2 dollars, and 7 yards would cost 7 *times* as much; that is, 7 times 2 dollars—14 dollars.

OBS. The above is solving questions in the *Rule of Three* by ANALYSIS.

☞ Let the following sums be solved and *explained* as above.

1. If 4 yards of cloth cost 12 dollars: what will 6 yards cost?
ANS. 18 *dols.*

2. If 4 barrels of flour cost 24 dollars: what would 7 barrels cost?
ANS. 42 *dols.*

3. If 8 sheep cost 24 dollars: what would 3 sheep cost?
ANS. 9 *dols.*

4. If 2 pounds of cotton will make 4 yards of cloth: how many yards will 5 pounds make? ANS. 10.

5. If a man can earn 16 dollars in 4 months: how long must he work to earn 84 dollars? ANS. 21 *mo.*

6. What will 12 gallons of oil come to, if 6 gallons cost 18 shillings? ANS. 36 *shil.*

Obs. In the previous operations, we divided to find unity—in the following, we must multiply.

Ex. If 3 teams can plow a field in 12 days: in what time will 9 teams do it?

Solution.—3 *times* 12 are 36—9 in 36, 4 times—the Ans. 4 *days.*

☞ Let the pupils *state* the sum in this manner.

If it take 3 teams 12 days, it will take 1, 3 *times* 12 days, that is, 36 days—and it will take 9 *teams*, the 9th part of 36 days, viz.: 4 days.

Hence, the rule to solve questions by *Analysis.*—First, find unity—then multiply or divide the third number by it; the fourth number will be the answer.

Obs. Let the pupils do the following sums, and *explain* them as above.

1. If a field feed 6 cows 9 days: how long will it feed 2 cows?
Ans. 27 *days.*

2. If 2 men can build a wall in 9 days: in what time could 6 men build it?
Ans. 3 *days.*

3. If 6 men can do a piece of work in 12 days: how long will it take 12 men to do it?
Ans. 6 *days.*

4. If a field will keep 2 cows 20 days: how long will it keep 5 cows?
Ans. 8 *days.*

5. 7 men have performed a piece of work in 5 days: how many men can perform the same work in 1 day?
Ans. 35.

6. If 5 men can do a piece of work in 6 months: in how many months will 10 do it?
Ans. 3.

PROMISCUOUS EXAMPLES IN ANALYSIS.

☞ Let the following sums be *stated* in the same manner as the preceding.

1. If 3 men can do a piece of work in 12 days: in how many days will 4 men do the same work?
2. If 2 men in 3 days will earn 14 dollars: how much will 7 men earn in the same time?
3. If 5 men can do a piece of work in 8 days: how many men must be employed to perform the whole in 1 day?
4. If 4 tuns of hay will keep 2 cattle over the winter: how many tuns will keep 6 cattle the same time?
5. If 3 barrels of cider cost 6 dollars: what will 10 barrels cost?
6. If 8 men can perform a piece of work in 5 days: how many days would it take 1 man to do it? How long would it take 4 men to do it?
7. If the wages of 6 men be 24 dollars: what will be the wages of 9 men?
8. If 6 yards of velvet cost 12 dollars: how much will 8 yards cost?
9. If 5 yards of cloth cost 10 dollars: what will 11 yards cost?
10. If 3 men can do a piece of work in 12 days: in how many days will 6 men do it?
11. If 12 men do a piece of work in 2 days: how many men will do the same in 6 days?
12. If 6 men can build a wall in 4 days: how many men can do the same in 2 days?
13. If 2 tuns of hay cost 24 dollars: what will 5 tuns cost?
14. If 3 men can erect a wall in 45 days: how many men can do the same in 5 days?
15. If a man travel 21 miles in 7 days: how far could he travel in 9 days?
16. If 5 persons consume 30 bushels of corn in one year: how much will 3 persons consume?

EXAMPLES IN MULTIPLICATION, DIVISION, AND ANALYSIS.

☞ Let the pupils do the following sums;—tell what RULE each example is in, and explain the operation.

1. A gentleman bought 4 yards of broadcloth for 20 dollars: what did he pay per yard?
2. If a man earn 4 dollars in a week: how many dollars will he earn in 3 weeks?
3. If 9 men can live on a quantity of provision 6 weeks: how many men could live on the same 1 week?
4. What cost 8 pounds of indigo, at 4 dollars a pound?
5. If a man buy 4 bushels of grain for 8 dollars: how much is that a bushel?
6. If 4 men can make a fence in 3 days: how long would 1 man be making it?
7. What cost 1 dozen of hats, at 9 dollars a piece?
8. Bought a piece of cloth containing 6 yards for 18 dollars: what did it cost a yard?
9. If 6 men eat 28 pounds of beef in a week: how much do they eat in a day?
10. A women went to a dry good shop, and paid 52 cents for 4 yards of ribin: how much was that a yard?
11. If 7 men can do a piece of work in 3 days: how many men can do it in 1 day?
12. If 3 bushels of corn be divided among 36 men: how much would they have a piece?
13. If 2 men can build a wall in 20 days: how many can do it in 5 days?
14. If a man earn 3 dollars a week: to what will it amount in 7 weeks?
15. What is the price of 390 yards, at 2 dollars a yard?
16. If 6 bushels of wheat cost 12 dollars: what is the cost of 1 bushel?
17. If 4 men can build a wall in 20 days: in how many days will 2 men do it?

18. If 100 men were to receive 8 dollars a piece: how many dollars would they all receive?

19. If 28 bushels of apples be divided equally among 4 persons: how many bushels will they have a piece?

20. A drover bought 53 sheep at an average price of 3 dollars a piece. What were the whole worth?

21. What would be the price of 9 barrels of cider, at 3 dollars a barrel?

22. If 3 men can do a piece of work in 4 days: how many days will it take 6 men to do it?

23. If you have a journey of 96 miles to go in 4 days: how many miles must you travel each day?

24. If a horse eat 3 bushels of oats in 1 week: how many bushels would he eat in 8 weeks?

25. A man gave 10 persons a bushel of corn a piece: how many bushels did it take?

26. If it take 3 yards of cloth to make a suit of clothes: how many yards will it take to make 2 suits?

27. If 5 bushels of wheat cost 10 dollars: what will 8 bushels cost?

28. If a family consume 2 bushels of malt in 1 month: how much will they consume in 3 months?

29. If 4 yards of cloth cost 16 dollars: what will 3 yards cost?

30. If it take 2 yards of cloth to make a pair of pantaloons: how many yards would it take to make 8 pair?

31. If 7 men can do a piece of work in 3 days: how many men will it take to do it in 7 days?

32. If you give 2 persons 3 bushels of wheat a piece: how many bushels will it take?

33. A baker owed a merchant 60 dollars, which he was to pay in bread. The merchant took 3 dollars worth of bread a week: how many weeks did it take the baker to pay the merchant?

PRACTICE

Is a short method of ascertaining the value of any quantity of goods, by the given price of the integer. It consists principally in solving questions in a more direct manner, by avoiding large multiplications and divisions, in whose stead we take aliquot parts, such as halves, thirds, fourths, &c.

METHOD.

When the price per pound, yard, &c.,
is 50 cents, *divide* by 2.
is $33\frac{1}{3}$ cents, *divide* by 3.
is 25 cents, *divide* by 4.
is 20 cents, *divide* by 5.
is $16\frac{2}{3}$ cents, *divide* by 6.
is $12\frac{1}{2}$ cents, *divide* by 8.

When the price is 4 pence, *divide* by 16—$6\frac{1}{4}$ cents is $\frac{1}{16}$ of a dollar
is 6 pence, *divide* by 12—$8\frac{1}{3}$ cents is $\frac{1}{12}$ of a dollar.
is 9 pence, *divide* by 8—$12\frac{1}{2}$ cents is $\frac{1}{8}$ of a dollar.
is 1 shilling, *divide* by 6—6 shillings make a dollar.
is 2 shillings, *divide* by 3—2 shillings is $\frac{1}{3}$ of a dollar.
is 3 shillings, *divide* by 2—3 shillings is $\frac{1}{2}$ of a dollar.

Common way of reckoning Money.

6 shillings is a dollar.
5 shillings is 84 cents.
5 and 6 pence is 92 cents.
5 and 3 pence is $87\frac{1}{2}$ cents.
4 shillings is 67 cents.
4 and 6 pence is 75 cents.
3 shillings is 50 cents.
3 and 6 pence is 58 cents.
3 and 9 pence is $62\frac{1}{2}$ cents.
2 shillings is 34 cents.
2 and 3 pence is $37\frac{1}{2}$ cents.
2 and 6 pence is 42 cents
2 and 9 pence is 46 cents.
1 shilling is 17 cents
9 pence is $12\frac{1}{2}$ cents.
6 pence is 8 cents.
4 pence is $6\frac{1}{4}$ cents

☞ Let the pupils perform the following operations.

1. What cost 560 bushels of potatoes, at 25 cents a bushel?

Solution.—Divide 560 by 4, thus: 4 in 5, once—4 in 16, 4 times—4 in 0, 0 times. 140 *dols.*

2. What cost 148 yards of cloth, at 50 cents per yard?

Solution.—Divide 148 by 2, thus: 2 in 14, 7 times—2 in 8, 4 times. 74 *dols.*

3. What cost 273 bushels of oats, at $33\frac{1}{3}$ cents a bushel?

Solution.—Divide 273 by 3, thus: 3 in 27, 9 times—3 in 3, once. 91 *dols.*

4. What cost 248 pounds of butter, at $12\frac{1}{2}$ cents per pound?

Solution.—Divide 248 by 8, thus: 8 in 24, 3 times—8 in 8, once. 31 *dols.*

5. What cost 205 yards of cloth, at 20 cents a yard?

Solution.—Divide 205 by 5, thus: 5 in 20, 4 times—5 in 5, once. 41 *dols.*

6. What cost 366 yards of cotton cloth, at $16\frac{2}{3}$ cents per yard?

Solution.—Divide 366 by 6, thus: 6 in 36, 6 times—6 in 6, once. 61 *dols.*

7. What cost 96 pounds of sugar, at 4 pence a pound?

Solution.—Divide 96 by 16, thus: 16 in 96, 6 times. 6 *dols.*

8. What cost 816 yards of cloth, at 9 pence a yard?

Solution.—Divide 816 by 8, thus: 8 in 8, once—8 in 1, 0 times—8 in 16, twice. 102 *dols.*

9. What cost 36 pounds of butter, at 1 shilling a pound?

Solution.—Divide 36 by 6, thus: 6 in 36, 6 times. 6 *dols.*

10. What cost 369 yards of flannel, at 2 shillings a yard?

Solution.—Divide 369 by 3, thus: 3 in 3, once—3 in 6, twice—3 in 9, 3 times. 123 *dols.*

11. What cost 864 bushels of corn, at 3 shillings a bushel?

Solution.—Divide 864 by 2, thus: 2 in 8, 4 times—2 in 6, 3 times—2 in 4, twice. 432 *dols.*

☞ Let the pupils now do the following sums:

1. What is the price of 140 yards, at 50 cents a yard?
2. What is the price of 160 yards, at 25 cents a yard?
3. What is the price of 40 yards, at $12\frac{1}{2}$ cents a yard?
4. What is the price of 50 yards, at 20 cents a yard?
5. What is the price of 108 yards, at $33\frac{1}{3}$ cents a yard?
6. What is the price of 120 yards, at $16\frac{2}{3}$ cents a yard?
7. What is the price of 320 yards, at 25 cents a yard?
8. What is the price of 540 yards, at 50 cents a yard?
9. What is the price of 232 yards, at $12\frac{1}{2}$ cents a yard?
10. What is the price of 148 yards, at 50 cents a yard?
11. What is the cost of 320 pounds, at 9 pence per pound?
12. What is the cost of 368 pounds, at 4 pence per pound?
13. What is the cost of 120 pounds, at 6 pence per pound?
14. What is the cost of 248 pounds, at 9 pence per pound?
15. What is the price of 36 yards, at 1 shilling a yard?
16. What is the price of 144 yards, at 2 shillings a yard?
17. What is the price of 126 yards, at 3 shillings a yard?
18. What is the price of 240 yards, at 1 shilling a yard?
19. What is the price of 480 yards, at 3 shillings a yard?
20. What is the price of 600 yards, at 2 shillings a yard?
21. What is the price of 142 yards, at 3 shillings a yard?
22. What is the price of 480 yards, at 1 shilling a yard?

PROMISCUOUS EXERCISES IN THE PRECEDING RULES.

☞ For Answers see Key, page 86.

1. Bought 25 yards of cloth for 5 dollars: what is that a yard?

Let the teacher ask the pupil, at each example—By what rule is this sum done? Why in that rule? What is that rule used for?

2. If 8 pounds of coffee cost 64 cents; what is the price of 1 pound?

3. Suppose you borrow 222 dollars, and afterwards pay 101 dollars. How much remains unpaid? ○

4. When the price of a pair of shoes is 2 dollars: How many pair may be had for 56 dollars?

5. What cost 160 bushels of corn, at 50 cents per bushel? ○

6. A man bought 1 sheep for 4 dollars, and another for 5 dollars: how much did he give for both?

7. I have 5 pieces of cloth, each measuring 42 yards. How many yards are there in the whole?

8. If 25 bushels of corn be divided among 5 men: how much would they have a piece?

9. Suppose a man travel 4 miles a day: how many days will he be traveling 240 miles? ○

10. If tuition be 3 dollars for 12 weeks: how much will it be for 4 weeks? ○

11. If a man spend 5 dollars in a week: how many dollars will he spend in 3 weeks?

12. If you travel 7 miles an hour: how many hours will it take you to travel 42 miles?

13. If 12 bushels of wheat be worth 24 dollars: how much are 8 bushels worth? ○

14. Sold 21 barrels of flour for 6 dollars a barrel: what is the amount? ○

15. Sold 5 yards of broadcloth for 10 dollars: at how much a yard did I sell it?

16. If 4 yards of cloth cost 12 dollars: what will 2 yards cost?

17. A man, owing 20 dollars, paid 16: how many remain to be paid?

18. If 2 men can do a piece of work in 6 days: how long would it take 4 men to do it?

19. What is the price of 7 yards of cloth: at 3 dollars a yard?

20. If 6 barrels of flour cost 36 dollars . . : what would 10 barrels cost?

21. A man bought 10 bushels of rye for 15 dollars, 6 bushels of apples for 6 dollars: how much did he pay for both?

22. If 10 bushels of wheat cost 20 dollars: what cost 1 bushel?

23. At 4 dollars a barrel: how many barrels of flour may be bought for 328 dollars?

24. A man bought 6 bushels of wheat at one time, and 2 at another: how much did he buy in the whole?

25. If 7 yards of cloth cost 21 dollars: what will 10 yards cost?

26. At 3 dollars a barrel, what will 3 barrels of cider cost?

27. If a man spend 28 dollars in a month: what is that a week?

28. If 3 barrels of cider cost 12 dollars: what will 10 barrels cost?

29. A man bought 3 barrels of cider for 9 dollars: what did he give a barrel?

30. If 4 men can build a wall in 4 days: how many men can do it in 8 days?

31. If a yard of cloth cost 4 dollars: what will 5 yards cost?

32. If 2 barrels of flour cost 12 dollars: what will 10 barrels cost?

33. Divide 3 bushels of corn equally among 9 men: how much would you give them a piece?

34. If 6 men can do a piece of work in 12 days: in how many days will 3 men do it?

35. What cost 7 hundred weight of sugar: at 9 dollars a hundred weight?

36. If a field, containing 5 acres, produces 75 bushels of wheat: how much is that for one acre?

37. What will a farm, containing 165 acres, amount to at 2 dollars per acre?

38. If 7 pounds of flour cost 35 cents: what will 9 pounds cost?

39. What is the value of 12 pounds of hyson skin tea: at 2 dollars a pound?

40. Sold 12 yards of cloth for 72 dollars: how much was it per yard?

41. If a man travel 5 miles in an hour: how many miles will he travel in 9 hours?

42. What cost 110 bushels of wheat, at 2 dollars a bushel?

43. If a man earn 12 dollars a week: what is that a day?

44. If 5 firkins of butter cost 40 dollars: what will 3 firkins cost?

45. If 6 sides of sole leather cost 30 dollars: what cost one side?

46. If 3 men can do a piece of work in 7 days: how long will it take 1 man to do it?

47. To divide 54 dollars equally among 6 persons: what sum must be given to each?

48. If 4 firkins of butter cost 24 dollars: what will 7 firkins cost?

49. What cost 6 tuns of hay, at 14 dollars per tun?

50. How many lots, each containing 6 acres, can be fenced in, from a farm containing 366 acres? ○

51. A man bought a cart for 13 dollars, and a plow for 7 dollars: how much did he pay for both?

52. A merchant sold 20 bushels of salt for 17 dollars, by which he lost 3 dollars. What did the salt cost a bushel? ○

53. What cost 36 yards of broadcloth, at 5 dollars per yard? ○

54. A hatter sold one dozen hats for 108 dollars. At how much a piece did he sell them?

55. A farmer sold a yoke of oxen for 68 dollars, by which he lost 13 dollars: can you tell how much his oxen cost him?

56. What cost 6 tuns of plaster Paris, at 61 dollars a tun?

57. If 24 dollars buy 12 yards of cloth: how many yards will 6 dollars buy? ○

58. A grocer bought 4 chests of tea, each weighing 62 pounds. how many pounds in all? ○

59. If 100 barrels of flour cost 800 dollars: what is that per barrel?

60. If a man earn 7 dollars in 1 week: how much would he earn in 5 weeks?

61. A servant was sent to market with 2 dollars to buy beef at 4 cents a pound: how many pounds could he buy? ○

62. What cost 145 gallons of wine, at 2 dollars per gallon? ○

63. If you divide 18 dollars equally among 6 men: how many dollars will each man receive?

64. A man bought 7 yards of cloth for 14 dollars: what was that a yard? What would 3 yards cost at that rate?

65. What do 210 hats come to, at 3 dollars each? ○

66. A man having 26 acres of land, sold 9: how many had he left?

67. Bought 36 bushels of corn, at 50 cents per bushel: what did it cost? ○

68. If an estate of 568 dollars be divided among 8 children: what will be each child's share? ○

69. A man sold 8 yards of cloth for 3 dollars a yard: to what did it amount?

70. Bought goods to the amount of 500 dollars, and paid, at the time of purchase, 300 dollars. How much remains to be paid?

71. A man bought 7 yards of one kind of cloth, and 6 yards of another kind: how many yards in the whole?

72. If a man can travel 12 miles in 3 hours: how many miles will he travel in 8 hours?

73. If 48 bushels of wheat be divided between 8 men: how much would they have a piece?

74. A merchant bought a quantity of coffee, for which he paid 560 dollars: he afterwards sold it for 610 dollars. How much did he gain?

75. If 1 pound of raisins cost 11 cents: how much will 6 pounds cost?

76. At 3 dollars a box: how many boxes of raisins may be bought for 12 dollars?

77. If there are 3 feet in one yard: how many feet are there in 4 yards?

78. If a storekeeper sell goods for 100 dollars, which cost 125 dollars, how much will he lose by the sale?

79. What cost 3 yards of cloth, at 7 dollars a yard?

80. A man bought a barrel of flour for 17 dollars, and not proving so good as he expected, he could sell it for no more than 13 dollars: how much did he lose on it?

81. 7 men can perform a piece of work in 5 days: in how many days would 5 men perform it?

82. If 9 reams of paper cost 45 dollars: what cost 1 ream?

83. At 7 dollars a barrel: how many barrels of flour can be bought for 63 dollars?

84. A merchant sold 8 pieces of cloth, at 12 dollars a piece: how much money did he receive for the whole?

85. A man bought a barrel of beef for 20 dollars, and, being damaged, he is obliged to lose 12 dollars on the sale of it: how much did he sell it for?

86. What cost 28 yards of cloth, at 8 dollars per yard?

87. If 10 horses cost 450 dollars: what was the price of each horse?

88. If a man travel 3 miles in an hour: how many miles will he travel in 4 hours?

89. What do 52 firkins of butter amount to, at 7 dollars a firkin?

90. If 4 yards of cloth cost 12 dollars: what will 3 yards cost?

91. Suppose your father should allow you 48 dollars a year for clothing: how much would that be each month?

92. A man bought a piece of cloth containing 93 yards, and sold 45 yards of it: how many yards had he left?

93. If a quantity of provision will last 4 men 7 days: how many men will it last 1 day?

94. How many barrels of flour, at 7 dollars a barrel: can you buy for 98 dollars?

95. What cost 37 barrels of flour, at 7 dollars per barrel?

96. At 5 dollars a barrel: how many barrels of fish may be bought for 45 dollars?

97. What is the amount of 800 dollars, 700 dollars, and 300 dollars?

98. A farmer wishes to divide 104 acres into 8 equal fields: how much will there be in each field?

99. If 1 pound of tobacco cost 8 cents: what will a keg of tobacco, weighing 112 pounds, cost?

100. A man bought a barrel of flour for 6 dollars, and sold it so as to gain 2 dollars. How much did he sell it for?

101. A merchant bought 76 bushels of salt, at 50 cents a bushel: how much did he pay for the whole?

102. Three persons hired a piece of land 3 months, for 75 dollars? what must each man pay?

103. If 3 dollars will buy 6 bushels of oats: how many will 5 dollars buy?

104. A man owing 48 dollars, paid 29: how many did he then owe?

105. What cost 75 acres of land, at 2 dollars per acre?

106. If 10 men can do a piece of work in 7 days: how many days will it take 1 man to do it?

107. At 8 dollars a cord: how many cords of wood may be bought for 56 dollars?

108. A man owing a sum of money, paid 29 dollars, and then he owed 19: how many did he owe at first?

109. If a man travel 35 miles in 7 hours: how many miles will he travel in one hour?

110. At 3 dollars a barrel: how many barrels of pork can be bought for 63 dollars?

111. If 3 bushels of wheat cost 9 dollars: what will 2 bushels cost?

112. A man bought 5 barrels of pork, at 17 dollars per barrel: how much did it come to?

113. If from a piece of cloth, containing 18 yards, you cut off 3 yards: how much will be left?

114. Bought a quantity of salt for 18 dollars, and sold it for 7 dollars more than I gave for it: how much did I sell it for?

115. What will 12 barrels of flour come to, at 10 dollars a barrel?

116. If 4 hats cost 12 dollars: what will 55 cost at that rate?

117. A man owing 48 dollars, paid all but 19: how many did he pay?

118. At 5 dollars a barrel: how many barrels of fish may be bought for 55 dollars?

119. If 23 men can build a wall in 3 days: how many men would it take to do it in 1 day?

120. A man has 6 children, all of whom are married, and each has 4 children; two of these grandchildren are married, and each has one child. How many children, grandchildren, and great grandchildren, are there? ○

A KEY OF ANSWERS.

Or. Answers are given, in the KEY, to examples having this character ○ affixed to them.

Page.	Example.	Answer.	Page.	Example.	Answer.
79	3	121	82	57	3
79	5	80	82	58	248
79	7	210	82	61	50
79	9	60	82	62	290
79	10	1	82	65	630
79	13	16	82	67	18
79	14	126	82	68	71
80	16	6	83	72	32
80	18	3	83	74	50
80	20	60	83	78	25
80	23	82	83	81	7
80	25	30	84	86	224
80	27	7	84	89	364
80	28	40	84	91	4
80	30	2	84	93	28
80	32	60	84	94	14
81	34	24	84	95	259
81	37	330	84	99	896
81	38	45	84	101	38
81	42	220	85	103	10
81	44	24	85	106	70
81	46	21	85	109	5
81	48	42	85	111	6
82	50	61	85	116	165
82	52	1	85	119	69
82	53	180	86	120	32

MONEY, WEIGHTS AND MEASURES.

Federal Money is the national currency of the United States.

10	mills (*m*)	make 1	cent, (sign)	*ct.*
10	cents	make 1	dime, "	*d.*
10	dimes	make 1	dollar, "	$
10	dollars	make 1	eagle "	*E.*
5	dollars	make 1	half eagle, (sign)	½ *E.*
2½	dollars	make 1	quarter " "	¼ *E.*

100	cents	make a dollar.
75	cents	make 3 quarters of a dollar.
50	cents	make half a dollar.
25	cents	make a quarter of a dollar.
12½	cents	make 1 eighth of a dollar.
10	cents	make 1 tenth of a dollar.
5	cents	make 1 twentieth of a dollar.

ALSO,

6 and 1 quarter	cents	make 1 fourpence-halfpenny.
2 fourpence-halfpennies		make 1 ninepence.
2 ninepences		make 1 quarter of a dollar.
4 quarters		make 1 dollar.
16 fourpence-halfpennies		make 1 dollar.
8 ninepences		make 1 dollar.

Troy Weight is used in weighing gold and silver.

24	grains (gr.)	make 1	penny-weight, (sign)	*pwt.*
20	penny-weights	make 1	ounce, "	*oz.*
12	ounces	make 1	pound, "	*lb.*

AVOIRDUPOIS WEIGHT is the common weight, used in weighing groceries, and all coarse commodities.

16 drams (dr.)	make 1 ounce.	(sign)	*oz.*
16 ounces	make 1 pound.	"	*lb.*
100 pounds	make 1 hundred weight.	"	*cwt.*
25 pounds	make 1 quarter.	"	*qr.*
2000 pounds	make 1 tun.	"	*T.*

APOTHECARIES' WEIGHT is used for the purpose of compounding medicines, but not in selling them.

20 grains (gr.)	make 1 scruple.	(sign)	*sc.*
3 scruples	make 1 dram.	"	*dr.*
8 drams	make 1 ounce.	"	*oz.*
12 ounces	make 1 pound.	"	*lb.*

CLOTH MEASURE is used in measuring cloth, lace, &c.

4 nails (na.)	make 1 quarter.	(sign)	*qr.*
4 quarters	make 1 yard.	"	*yd.*
5 quarters	make 1 English ell.	"	*E. E.*
6 quarters	make 1 French ell.	"	*E. Fr.*
3 quarters	make 1 Flemish ell.	"	*E. Fl.*

DRY MEASURE is used in measuring grain, salt, &c.

2 pints (pt.)	make 1 quart.	(sign)	*qt.*
8 quarts	make 1 peck.	"	*pk.*
4 pecks	make 1 bushel.	"	*bu.*

Wine Measure is used by grocers and others, for measuring wine, oil, melasses, and most other liquids.

4	gills (gi.)	make 1 pint.	(sign)	*pt.*
2	pints	make 1 quart.	"	*qt.*
4	quarts	make 1 gallon.	"	*gal*
31½	gallons	make 1 barrel.	"	*bl.*
2	barrels	make 1 hogshead.	"	*hhd.*
2	hogsheads . . .	make 1 pipe.	"	*p.*
2	pipes, or 4 hhds. .	make 1 tun.	"	*T.*

Long Measure is applied to length, distance, &c.

3	barleycorns . . .	make 1 inch.	(sign)	*in.*
12	inches	make 1 foot.	"	*ft.*
3	feet	make 1 yard	"	*yd.*
5½	yards or 16½ feet .	make 1 rod or pole.	"	*rd.*
40	rods	make 1 furlong.	"	*fur.*
8	furlongs	make 1 mile.	"	*mi.*
3	miles	make 1 league.	"	*L.*
9⅛	furlongs	make 1 geographical mile.		
60	geographical miles .	make 1 degree.	"	*deg.*
360	degrees	the earth's circumference.		

Square Measure is used in measuring land, flooring, boards, tiling, and all other surfaces whatever.

144	inches	make 1 foot.	(sign)	*ft.*
9	feet	make 1 yard.	"	*yd.*
30¼	yards, or 272¼ ft. .	make 1 rod or pole.	"	*rd.*
40	rods	make 1 rood.	"	*r.*
4	roods	make 1 acre.	"	*A.*
640	acres	make 1 mile.	"	*mi.*

FEDERAL MONEY.

What is the national currency of the United States? How many dollars make an eagle? Half-eagle—quarter-eagle? Are an eagle, half-eagle, and quarter-eagle, *gold* coin? How many *cents* make a dollar? half-dollar—a quarter—three quarters—a dime—half-dime? A ninepence? How many 10 cent pieces make a dollar? Half-dollar? How many 5 cent pieces make a dollar? Half-dollar—a quarter—three quarters? How many 12½ cent pieces make a dollar? Half-dollar—a quarter—three quarters? Are a dollar, half-dollar, quarter, 10 and 5 cent pieces *silver* coins? What kind of coin are cents and half-cents? Is there such a piece of money as a mill? How many mills make a cent? The making of money is called coining. The place is called the mint.

TROY WEIGHT.

What weight is used in weighing silver, gold, money, or articles that are made of gold or silver? How many penny-weights make an ounce? How many ounces make a pound? What does *pwt.*, *oz.*, *lb.* stand for? Scales are used to weigh gold, silver, and articles made of either of them.

AVOIRDUPOIS WEIGHT.

By what weight are iron, steel, hay, hides, leather, fish, beef, pork, veal, mutton, grain, flour, sugar, tea, coffee, cheese, butter, and groceries weighed? How is a pound divided? How many drams make an ounce? How many ounces make a pound? How many pounds make a quarter of a hundred? Make a tun? What does *oz.*, *lb.*, *cwt.*, *qr.*, *T.* stand for? Steelyards and scales are used to weigh coarse commodities and groceries.

APOTHECARIES' WEIGHT.

By what weight are camphor, opium, salts, rhubarb, calomel, jalap, and other medicines weighed? How many grains make a scruple? How many scruples make a dram? How many drams make an ounce? How many ounces make a pound? What does *lb.*, *oz.*, *dr.*, *sc.* stand for? Scales are used to weigh medicines.

CLOTH MEASURE.

What measure is used in measuring cloth and several of the articles of which our dresses are made? How is a yard divided? How many nails make a quarter? How many quarters make a yard? What does *na.*, *qr.*, *yd.* stand for? A yard stick is used to measure cloth. It is 3 feet, or 36 inches long.

DRY MEASURE.

By what measure are corn, rye, wheat, oats, barley, peas, beans, potatoes, salt, fruit, roots, coal, &c. measured? How is a bushel divided? How many pecks make a bushel? How many quarts make a peck? How many pints make a quart? What does *pt.*, *qt.*, *pk.*, *bu.* stand for? A bushel, peck, quart, and pint measures are used in measuring all kinds of grain.

WINE MEASURE.

By what measure are wine, oil, mclasses, spirits, &c. measured? How many barrels make a hogshead? How many gallons make a barrel? How many quarts make a gallon? How many pints make a quart? How many gills make a pint? A gallon, quart, pint and gill measures are used in measuring.

TIME.

How is time divided? How is a year divided? How many months in a year? What are their names? How many days in each? In a year? How many weeks in a month? How many days? How many days in a week? What are the names given to the *four* seasons? Which are the Spring months? the Summer—Autumnal—Winter? How many hours make a day? How many minutes an hour? How many seconds a minute? What are clocks and watches for? How is the day divided? What part of the day is called noon? Forenoon? Afternoon? Morning? How many years make a century? How many centuries to the present year, 1835?

WRITING CHARACTERS.

A Mother's Kindness.

1. Behold, my son, said a kind father, that hen with her little brood. With what care she provides them with food; and in speech, which they all know, calls them about her, and bids them eat.

2. When the hawk is abroad in the air; when the kite hovers in the clouds for his prey; her watchful eye observes them, and she gathers her young under her wings, and covers them from danger.

3. With what ease could the hawk dart upon her, and carry her off in his talons! And yet how boldly she faces her enemy, and dares his approach! Thus she daily spends her strength to feed her young, and exposes her life to defend them.

4. Does not the sight of this hen and her little brood, bring to your mind, my son, the watchful care of your mother, in the days of your tender infancy? She then danced you on her knee, folded you in her arms, pillowed you on her bosom, and fed you with the warm milk of her breast.

5. When sick, she wept over you in anguish, when pleased, she smiled at your playful mirth, and when danger came, she bared her own head to the shaft, that she might shield yours.

6. Your mother has taught your infant tongue to lisp the names of Pa. and Ma. And even now, she is daily planting in your soul the love of wisdom, truth, and virtue. She is pouring into your ear, and engrafting upon your mind, those precepts and maxims which will enable you to become useful in life, and happy in another world.

7. Your mother's love for you is stronger than death; for your life, she would give her own; to shelter you from danger, she would even dare the open jaws of a hungry lion, the devouring flames of a devoted house, or the mounting waves of the angry deep.

8. What a debt of love, of respect, and of willing obedience, do you owe her! You only, my son, can pay this debt; and you can pay it in one way only. Money will not pay it; tears will not; the whole world cannot. You, and you only, can pay it.

9. By the exercise of affection, pure and constant—of gratitude, deep and durable—of respect, high and unwavering—of esteem, warm from the heart, and that knows no change—you may possibly cancel the debt. Love is paid only by love; and in the sweet exchange let no base matter mix.

Proverbs for the Young.

1. My son, hear the words of thy father, and forsake not the law of thy mother: for they shall be a crown of beauty to thy head, and a chain of gold about thy neck.

2. If you seek knowledge, and lift up your voice for understanding; if you search for wisdom as for silver, and for hidden treasure; discretion shall preserve you, and integrity shall deliver you from the man of strife and blood.

3. My son, forget not the law of the Lord, but let your heart keep his commandments; so shall truth and mercy remain with you, and you shall find favor in the sight of God and man.

4. Happy is the man who finds wisdom, and the

man who gets understanding; for the merchandise of it is better than the merchandise of silver, and the gain of it, than fine gold.

5. Length of days is in her right hand, and in her left are riches and honor. Her ways are ways of pleasantness, and all her paths are peace; and she is a tree of life to those that take hold on her.

6. I, wisdom, dwell with prudence; pride and arrogance, I hate; a froward mouth and lying tongue, I abhor; but truth and an upright heart, are my delight.

7. Counsel is mine; understanding is mine; and strength is mine. By me, kings reign, and judges decree justice; and my delight is in the sons of men.

8. I love them that love me; and those that seek me early shall find me; and I will be better unto them than gold, yea, than much fine gold.

9. Now, therefore, hearken unto me: blessed is he that keeps my ways, for he shall eat of my bread, and drink of my wine, and his soul shall not famish.

10. I, Wisdom, have hewn out my seven pillars, and built my house. I have mingled my wine, prepared my feast, and furnished my table. I now cry unto him who is simple, to turn in hither and partake of my bounty: and to him that wants understanding, I say, come, eat of my bread, and drink of my wine, and increase in knowledge and virtue, that your soul may live.

Friendship.

1. As the tenderness of a mother in the day of distress, and the love of a father in the hour of trouble, so is the help of a friend in the time of need.